The Milbank Memorial Fund

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CONTENTS

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WITH the retirement of Bertrand Brown from the staff of the Milbank Memorial Fund on December 31, 1933, the *Quarterly Bulletin* loses its editor who developed it from a small news bulletin to its present position as a periodical in the fields of public health and social welfare.

For over ten years Mr. Brown has guided the Fund's many publications. First joining its staff as editorial assistant in 1923, he was appointed an Assistant Secretary in 1925, and Director of the Division of Publication when it was established in 1929. When the *Quarterly Bulletin* took its present form two years ago, he became its editor.

In the field of publication Mr. Brown has made an unique contribution. The content of the Fund's publications has been enriched by his painstaking labor, and their perfection of form was a direct result of his discriminating taste and creative ability. The high artistic standard he set has influenced publications in this field in no inconsiderable degree. Mr. Brown is broadening the scope of his work and will resume his former independent service in the interpretation of public health and welfare organization. The Fund deems itself fortunate that in this capacity it will be able to avail itself of his services.

The *Quarterly*, beginning with this issue, will be under the editorship of Edgar Sydenstricker. Although it will continue to present the principal results of the work of the Fund's staff and of those associated with it, it will also publish articles from others on subjects related to the general purposes of the foundation and, it is hoped, render a service as a journal in the broad fields of public health and social welfare.

HEALTH INSURANCE IN EUROPE

by G. F. McCLEARY, M.D.[1]

THE report of the Committee on the Costs of Medical Care and the discussions and controversies it has roused have brought prominently before the American public the magnitude of the outstanding problem the Committee was appointed to consider, a problem which has been defined by Dr. Olin West, secretary of the American Medical Association, as that of providing "adequate scientific medical care to all people, rich and poor, at a cost which can reasonably be met by them in their respective stations in life."

The Committee find that although in 1929 the people of the United States spent 3,656 million dollars on medical services, equivalent to $30 per head, or about 4 per cent of the money income of the country, "many persons do not receive service which is adequate in quantity or quality and the costs of service are unequitably distributed." They find also that because of the impossibility of predicting the onset or severity of sickness, budgeting for medical care on an individual family basis is impracticable, and that "on the present fee-per-service basis it is impossible for 99 per cent of the families to set aside any reasonable sum of money with positive assurance that the sum will purchase all needed medical care." The result, say the Committee, "is a tremendous amount of physical pain and mental anguish, needless deaths, economic inefficiency, and social waste."

The Committee were satisfied that the solution of the problem was not to be found in a reduction of physicians' fees, for in 1929 one-third of all private medical practitioners

[1]Formerly Principal Medical Officer of the English National Health Insurance Commission.

had net annual incomes of less than $2,500, and the majority of the members recommended that the costs of medical care should be met by adopting the principle of insurance—by spreading the risk of sickness so that it is borne not by one pair of shoulders but by many. The recommendation is that organized groups of potential patients should unite voluntarily in paying agreed periodical sums into a common fund, and should arrange for the provision of medical care with organized groups of medical practitioners who would derive their remuneration from the fund. But eleven members of the Committee recommend that insurance should be adopted on a compulsory basis, and even those signatories of the minority report who are against insurance for medical care would prefer instead of the scheme recommended by the majority "the method to which European countries have come through experience, that is, a compulsory plan under government control."

To a European reader these recommendations are of special interest, for in Europe insurance against sickness has been widely spread among the poor for centuries. In a rudimentary form and on a voluntary basis it was undertaken by the guilds of the Middle Ages, especially the social guilds, which were associations of poor men and women coming together of their own free will to give practical expression to the need of mankind for mutual aid in times of trouble. And after the suppression of the guilds during the Reformation the desire for mutual aid found a new outlet in the work of the friendly societies, which became one of the most stabilizing and beneficient influences in the social life of northern Europe. As long ago as the seventeenth century the friendly societies received the blessing of one of the most acute observers of practical affairs, Daniel Defoe, the father of the English novel and a voluminous writer on social questions, who in

his ESSAY ON PROJECTS, published in 1697, devotes a chapter to them, explaining and commending their work, particularly the provision made by them for insurance against sickness; and a century later we find Crabbe in THE BOROUGH giving poetical expression to his admiration for the friendly societies, inspired doubtless by what he had seen of their activities in his work among the poor both as clergyman and physician.

But though the work of the friendly societies was of immense social value it did not completely fill the bill. It appealed to the more far-sighted and provident of the wage-earners: the least provident remained outside the societies and when disabled by sickness became a charge upon public relief funds or private charity or both. Such persons would not come within the scope of health insurance without some form of compulsion, and years ago advocates of compulsory insurance began to be heard in England and Germany. Among the earliest was Defoe, who in his ESSAY ON PROJECTS outlines a plan of compulsory health insurance, curiously modern in some of its details, which, he contended, would secure the country "against beggars, parish poor, almshouses and hospitals, by which not a creature so miserable or so poor but should claim subsistence as their due and not ask it of charity." In these words the author of ROBINSON CRUSOE sounded the note of modern social insurance, which places the poor man in a position where he can "claim subsistence as his due and not ask it of charity."

But compulsory health insurance, though it had some small tentative beginnings in the eighteenth century, was not introduced on a national scale until 1884, nearly two centuries after Defoe's plan, when Prince Bismarck's scheme became operative in Germany. Other countries soon followed, and compulsory health insurance is now in operation over nearly the whole of Europe and also in Chili and Japan.

The European schemes of compulsory health insurance differ materially among themselves, but have certain broad features in common. In all schemes the persons required to be insured are persons working for an employer under a contract of service, written or oral, either in manual labor, or in non-manual labor if receiving a salary that does not exceed a specified amount. To such persons the onset of disabling sickness is a real calamity, for disablement means complete loss of earnings and that at a time when the imperative need for medical treatment imposes new burdens upon the sick man. Persons working on their own account, small shopkeepers for instance, or farmers, are much more favorably placed to meet the economic shock of sickness although financially they may be in no better position than the wage-earner. A shopkeeper disabled by illness may contrive to have his business carried on for him more or less successfully and at all events without complete loss of income. In some countries compulsory insurance applies only to persons employed in callings in which the risk of sickness is high, such as coal mining; in other countries it applies to practically all persons earning wages or small salaries. The proportion of the insured to the total population varies therefore among the different countries; in Poland it is 7 per cent, and in England about 38 per cent.

In nearly all countries the cost of the insurance scheme is shared by the insured person, his employer, and the state as representing the taxpayer. The insured person's contribution is a specific payment for the purpose of the scheme, and it is this feature of health insurance that distinguishes it from other forms of communal provision of medical services. As the contributions are collected by periodical deductions from wages, it is brought home to the worker that he is paying, in part at all events, for his insurance. He is fully alive

to that consideration. When receiving insurance benefits he feels he is receiving something for which he has paid. In Defoe's words he "claims subsistence as his due and does not ask it of charity." The introduction of social insurance has frequently been urged on the ground that it encourages this feeling of independence and self-respect among the poor.

The employer is also required to contribute to the cost of the scheme. The requirement is held to be justified on the ground that the employer has a direct interest in the health of his employees. He pays the joint contributions of himself and each of his employees, and then deducts the employee's share of the joint contribution from his wages. Usually the employer's share of the joint contribution is one-third. In England it is one-half in the case of a male employee and slightly more than half in the case of a woman.

In all countries a part of the cost is borne by the state. The health of the industrial workers of a country is a matter of vital concern to the state, and since the state requires the workers to insure it may fairly be expected to bear some part of the cost of insurance. In England the sums paid by the state are equivalent to about 19 per cent of the total cost.

What does the insured person receive in return for his contributions? He receives in time of sickness assistance in cash and assistance in kind. The object of health insurance is twofold: to enable the insured person to keep his home together when he is too sick to work, and also to provide him with such medical treatment as may be necessary to restore his lost working capacity. Week by week the disabled worker receives cash payments which, though not equal to the wages he would earn when at work, enable him to carry on without severe privation. The sick man's mind need not be distracted by anxiety about where the next day's meals are to come from, and that alone makes for early recovery. The cash

benefits have their therapeutic as well as their economic value. But the cash benefits of national health insurance are not limited to payments in times of disabling sickness. A sum of money is paid on the confinement of an insured woman, married or single, or the wife of an insured man—maternity benefit, and most schemes provide a "funeral benefit" on the death of an insured person, that is, a cash payment intended as a contribution towards the cost of burial. A health insurance scheme, then, usually provides sums of money for three contingencies: birth, disabling sickness, and death.

But in the modern development of health insurance the cash benefits are viewed as less relatively important than the benefits in kind, that is, the provision of medical and ancillary treatment. In the early days it was not so, for health insurance was primarily intended not for the cure or prevention of disease, but for the relief of poverty caused by disease. The leaders of the voluntary insurance movement during the greater part of the nineteenth century were more interested in the economic than the health aspects of social amelioration, and the provision of medical treatment is a comparatively recent development of health insurance. With the rapidly increasing efficiency of medical science and medical technique it is now felt that merely to compensate a disabled worker for loss of earnings is the least important task of health insurance. It is more important to give him treatment that will get him well, that will restore his power to earn. The old note was "compensation"—the modern note is "restoration."

But the provision of medical services is a much more difficult matter than the payment of cash benefits. A scheme that sets out to provide medical treatment for millions of insured persons—there are 15 millions in England and Wales—

needs the services of thousands of physicians, and if the scheme is to succeed they must work under conditions that make for effective professional service and are in harmony with the great traditions of the medical profession. The work of a physician tends to foster an individualistic professional outlook. The intimate and confidential nature of the relation of physician to patient is unique in human intercourse. The physician is keenly alive to it, and is intensely hostile to any arrangements for the provision of medical services that seem to impair that relation by the interposition of a third party. Hence the attitude of the medical profession to the introduction of compulsory health insurance is generally one of profound suspicion, if not hostility, which may find expression in an uncompromising refusal to consider insurance proposals at all, or, while accepting the principle of compulsory insurance, by insistence on certain conditions of medical service, definitely formulated and pressed on the government by the profession. The latter policy was successfully adopted by the profession in England and in France.

The English experience is of special interest. When the National Health Insurance Bill was introduced in 1911 the medical profession in England were in a strong position. Their organization, the British Medical Association, had highly competent leaders, who had for many years made a close study of the working of health insurance on a voluntary basis. They had had ample notice that the compulsory scheme was coming, for the intention of the Government to introduce such a scheme had been announced two years earlier. They had formulated a definite policy, which gave expression to the views held by the general body of the profession.

The policy of the British Medical Association was based on a principle on which the medical profession throughout Europe are almost unanimous, namely, that medical prac-

tice under a national scheme of insurance against sickness shall be conducted on the lines of private medical practice, as far as may be consistent with the assumption by the physician of his insurance responsibilities and the receipt by him of remuneration from the public funds. The Association held that to make this principle operative it was necessary (1) that every insured person should be provided with a family physician, (2) that every qualified physician should have the right to undertake the treatment of insured persons if he wished to do so, and to combine insurance practice with the conduct of his private practice, and (3) that the insured persons should have the right to choose, and, if they wished, to change their physicians. These conditions the Association contended could best be put into practice by the establishment of the "panel system."

The term "panel system" is sometimes used as synonomous with "insurance medical practice." But it is not so. In some European countries the insurance physicians do not work under a panel system, but are whole-time salaried officers selected by the insurance authorities and assigned to districts. The panel system is one in which the local body responsible for a medical service prepares a list or "panel" of physicians who undertake to give medical treatment on a part-time basis; every physician has the right to join the panel and the patient has the right to choose and change his physician. The method of remuneration of the physicians may vary. At the present time all the insurance physicians in England have elected to be paid on a capitation basis, but until a few years ago there were two areas, Manchester and Salford, in which the panel physicians were paid for each attendance given. They found, however, that payment per attendance involved so much bookkeeping that they discontinued it and adopted the capitation method of payment.

The panel system formed no part of the insurance scheme as laid before Parliament by the Government. It was formulated by the medical profession and accepted by the Government at the instance of the medical profession as the method by which the conditions of insurance practice can be made most closely to resemble those of private practice. Other demands were also conceded. The desire of the physicians to take part in the administration of medical benefit was met by removing the administration of the benefit from the insurance societies to local committees, specially constituted for the purpose, on which the profession was represented. A statutory local medical committee with important functions was also formed for every county area, and the physicians in each area were given the right to choose their method of remuneration. These new provisions together with the "panel system" as already described, were inserted in the insurance bill, and a comparison of the bill as originally introduced with the bill as it became an Act of Parliament is interesting as showing the enormous influence that can be exercised on legislation by a well-organized medical profession. As a result of these concessions to medical opinion, the scheme in actual operation has worked in an atmosphere of good will and without friction between the physicians and insurance authorities.

The insurance physicians are by their own choice paid on a capitation basis, the capitation fee being fixed by an independent body of arbitrators at 9 shillings or $2.25. Since there are 15 million insured persons in England and Wales and 15,000 insurance physicians, the average remuneration of a physician for his insurance work is £450 or $2,250.[2] It has been found that the average number of calls per insured

[2]During the economic crisis in the autumn of 1931, the insurance physicians accepted a reduction of 10 per cent in their remuneration as a temporary measure of national economy.

person is about 3.5, so that 1,000 persons require about 3,500 calls annually, or twelve per working day (allowing 300 working days in the year), of which eight are office calls and four visits to the patients' homes.

The British health insurance scheme attained its twenty-first birthday on July 15, 1933, and the event was celebrated at a luncheon meeting in London over which the Minister of Health presided, with Mr. Lloyd George, the father of the scheme, as the guest of honor. It is interesting to note that the British Medical Association was prominent among the various bodies that organized the meeting.

The scheme in spite of the enormous magnitude of its operation has worked smoothly and efficiently. It has met with criticism, but with no suggestion that it should be abolished or superseded. It was devised to help the poorer sections of the community to help themselves. In England the wage-earning classes are for the most part unable out of their own unaided resources to make adequate provision against sickness. But they are able to pay substantial sums in periodical payments spread over a long period. The insurance scheme requires them to insure themselves against sickness—the most universal of human calamities—and by contributions from the employer and the state it helps them to build up a common fund from which they may be provided for when unable to earn wages, and so prevented from becoming a charge upon public relief, or private charity, or both. The man who draws insurance benefit is not in the position of a recipient of charity. He is receiving something to which he has made a substantial contribution, and to which he is entitled. He feels that very strongly, and the feeling helps him to retain his selfrespect in time of adversity. It is thought that it is not a bad thing for the national character that such a mental attitude should be encouraged.

The work of the British insurance scheme was subjected to a critical examination by a Royal Commission, whose report appeared in 1926. Among the numerous organizations that gave evidence before the Commission was the British Medical Association, which testified that the scheme had been sufficiently successful to justify the medical profession "to unite to ensure the continuance of an insurance system." In support of this opinion the Association made the following statements:

> "Large numbers, indeed whole classes, of persons are now receiving a real medical attention which they formerly did not receive at all.
>
> "The number of practitioners in proportion to the population in densely populated areas has increased.
>
> "Illness is now coming under skilled observation and treatment at an earlier stage than was formerly the case.
>
> "Speaking generally, the work of practitioners has been given a bias towards prevention which was formerly not so marked.
>
> "Cooperation among practitioners is being encouraged to an increasing degree.
>
> "There is now a more marked recognition than formerly of the collective responsibility of the profession to the community in respect of all health matters."

After an exhaustive inquiry the Royal Commission issued a report which was highly favorable to the scheme. Their general conclusion was in the following terms:

> "We can say at once that we are satisfied that the Scheme of National Health Insurance has fully justified itself and has, on the whole, been successful in operation. The workers of this country have obtained under it substantial advantages, in particular by securing the title to free medical attention and medicine whenever and as soon as these are required, and by the proportionate diminution,

> to the extent of the cash benefit granted, of their anxiety as to the loss of wages during illness. . . . We are convinced that National Health Insurance has now become a permanent feature of the social system of this country, and should be continued on its present compulsory and contributary basis."

It is a remarkable fact that in no country in which a scheme of compulsory health insurance has been adopted has any movement arisen to abolish it. On the contrary, when a scheme has once begun to work a growing tendency develops to extend its field of operation. In no country has criticism been lacking, but the critics have directed their attacks against particular aspects of the respective national schemes, and not against the broad principles of health insurance. This is especially true of the criticism that has come from the medical profession, for though in many countries the physicians have been among the most severe critics of insurance administration we find that the General Council of the International Medical Association which met in Paris in September, 1928, passed the following resolution, with which this article may conclude:

> "The Association fully approves the principle of sickness insurance for the poorer classes of the community. This principle represents a great social advance and a powerful factor in the prosperity and welfare of nations."

YUGOSLAVIA LEADS IN RURAL HEALTH CENTERS

by VICTOR O. FREEBURG

THE dedication recently of the ninetieth rural health center in Yugoslavia, named in honor of King Alexander I, draws attention to the remarkably successful work of the peasant cooperative societies in organizing their local medical and public health facilities. The establishment of these health centers, one after another during the last twelve years, is a heroic achievement of reconstruction, which has already provided old Serbian Yugoslavia with a more extensive health organization of the rural masses than can be found in any similar area, except perhaps in Denmark.

This achievement, incidentally, has increasingly justified, year after year, the faith of American friends of Yugoslavia who contributed counsel and funds in order to help its people recover from the devastation of the World War. How effectively the Yugoslavians had been able to organize their own resources was observed in 1932, during a tour of inspection, by John A. Kingsbury, secretary of the Milbank Memorial Fund, chairman of the executive committee of the Serbian Child Welfare Association in America, who attended the dedication of the King Alexander I Health Home. Mr. Kingsbury, as he went from center to center, was deeply impressed by the change from the terrible conditions which he had witnessed in 1920, when, as chairman of the executive committee of the Serbian Relief Committee, he visited that war-ridden country.

It may be mentioned here that an initial gift of $100,000 in 1920 from the Milbank Memorial Fund enabled the Serbian Child Welfare Association of America, the successor to the Serbian Relief Committee of America, to raise $3,000,000 in money and materials for the furtherance of its work.

Before telling how the health zadrugas function we may sketch in the background of their development. The story begins in 1918 with the survey of Serbian needs made by a commission headed by Homer Folks, then Lieutenant-Colonel in the American Red Cross. This survey was supplemented by later surveys made by William J. Doherty and Mr. Kingsbury. A program was drawn up by the Serbian Child Welfare Association of America, and Dr. R. R. Reeder was chosen to direct the work as overseas commissioner for the Association and to act in cooperation with the Serbian Advisory Board.

The public health activity of the Association grew out of its initial work of caring for Serbian war orphans and the reconstruction of trade and village schools. In the restoration of one hundred and twenty-five schools the Association had a policy of contributing on a "fifty-fifty" basis. But so enthusiastic were the Serbians that in many cases they themselves gave more than their half of the costs.

A pioneering accomplishment, in which the Association cooperated with the Ministry of Health, the Medical Association, the Serbian Red Cross, and various voluntary agencies, was the establishment of the Training School for Nurses, in Belgrade, the first of its kind in the Balkans. This school was opened in May, 1923. Housed in its own building, a five-story structure of brick and concrete, the school has ample accommodations for 150 nurses with their teaching staff and offices. Four other training schools for nurses, situated in Skoplje, Zagreb, Ljubljana, and Valejvo, modeled on the one in Belgrade, have since been organized.

At the time when the Belgrade school was organized it was difficult to persuade girls from good families to become nurses, because the occupation of nursing was looked down on. This attitude was soon changed and today the student nurses come from the best of Yugoslavian families.

The opening of one of the ninety health centers is celebrate

Patients at one of the cooperative health stations

Infant welfare service is provided at the centers

chool children are vaccinated at the health centers

The movement to establish rural health centers was undertaken to meet the most basic needs of medical care, sanitation, and health education. There was only one doctor for 30,000 people, and the peasants, constituting 90 per cent of the population, suffered pitifully from the absence of health facilities, and from ignorance of even elementary hygiene.

The first health center was established early in 1921 at Chachak in a prefecture with a population of more than 50,000, and with but one hospital, and that badly equipped and undermanned. In a suitable house rented for the purpose, a dispensary was established, with a doctor, a dentist, and a nurse in attendance. Another nurse was engaged in public health work. Mothers' meetings, infant welfare classes, special classes in hygiene, home nursing, and sewing were inaugurated. A four-bed infirmary was also established.

Ten rural health centers of this general type were inaugurated by the Serbian Child Welfare Association before it withdrew from active participation in 1923. From the beginning, Mr. Kingsbury points out, the Association had held to the policy that "whatever you induce a people to do for themselves is of infinitely more value than what you do for them." Considering how to insure continuation of the rural health center movement after its withdrawal, the Association had decided to encourage the Agricultural Zadrugas (cooperative societies) to assume the obligation of supervision. Certain zadrugas had, in fact, already conducted an inquiry as to health and living conditions of the peasants, and readily agreed to organize health branches. A central body, the Union of Health Zadrugas, was later organized to take over health center work, and a headquarters office was opened in Belgrade. The new organization was approved by the Ministry of Health, which appropriated over a million dinars for health zadruga work in 1923.

The typical set-up at each center then included a doctor and a health worker paid by the local zadruga. A dentist went from center to center rendering services. Medicines and toilet supplies were sold at the centers. These as well as medical service were provided at low cost to members of the zadrugas. The very poor received free treatment.

The above brief account of certain activities of the Serbian Child Welfare Association of America by no means indicates the scope of the Association's work, but is merely given as a background for the health zadruga movement.

By 1928 the total number of health centers had risen to forty-three. During the summer of that year Mr. Folks made another visit to Yugoslavia, and surveyed the progress and problems of the zadrugas. Reporting that, while in many cases existing buildings had been taken over, there were also new buildings specially constructed, he wrote of a typical one that it was "a more imposing building than either the church or the school." It consisted of two stories and a basement, the cost being about $3,500, which was evidently divided between the Ministry of Health and the local zadrugas. The typical local committee, he wrote, included the head of the local schools, the local clergyman, and other leading citizens, including farmers.

However, according to Mr. Folks, the health work being done consisted mainly of medical treatment. The doctors and other workers lacked training for preventive efforts, including sanitation. Meeting with the Committee of the Union of Health Zadrugas in Belgrade, Mr. Folks accordingly suggested that if the Committee approved he would recommend to the Serbian Child Welfare Association that part of its remaining funds be expended for the benefit of an extended public health program.

In general this program, which was accepted by the Asso-

ciation, called for the support of courses in public health at the Central Institute for Hygiene, for zadruga physicians, for inspection tours to other zadrugas by the presidents or other representatives of the zadruga committees, and courses in hygiene for boys and girls at the local center. It also called for the installation of model sanitary accessories, such as toilets, cesspools, and equipment for the sanitation of stables and pigsties. There was also provision for a statistical health survey in the zadruga districts, which aimed especially to assemble information needed for antituberculosis work.

Meanwhile the people themselves were becoming increasingly enthusiastic in organizing new health zadrugas, and providing new buildings, now usually called health homes. "I visited most of the zadrugas in the past ten months," reported George Radin, a representative of the Association. "Everywhere I found the public proud of what is going on in their zadruga. They took active interest in every new development. In this lies the success of the system. People call it their own institution and treat it as such." At the same time the people are grateful for help given from abroad, and they sometimes choose the names of foreign friends to designate the centers. There is, for instance, The Lady Evelyn Haverfield Health Home at Bajna Basta, the John Kingsbury Health Home at Pranjane, and the Elizabeth Milbank Anderson Health Home at Slovac.

An example of local enthusiasm was seen in the dedication of the Kingsbury Health Home, as described by Mr. Radin in a letter dated November 14, 1930. He wrote: "The consecration of the Health Home was a historic event for Pranjane. . . . Everybody was present. People traveled half the night to get there, some of them coming from Chachak, thirty-five kilometers away, on foot. The villagers wore their best holiday clothes. His Majesty, King Alexander, sent his represen-

tative in the person of a colonel in the army. The Prime Minister sent his representative. Four priests conducted the religious services." Mr. Radin then describes the festivities which followed. There were "more than a thousand peasants, boys and girls, young and old, dancing the 'kolo' hand in hand on the green lawn." A veritable banquet was served. Mr. Radin commenting to a peasant on the lavishness of the feast, received a significant reply. "The building cost every one of us a lot of hard labor," said the peasant. "We hauled the brick and the rest of the material from Milanovac, twenty-eight kilometers away, walking alongside our oxen. We did this when it was too rainy or muddy for field work. Besides, it cost us money as well. When we made all these sacrifices, who could have stopped any of us from contributing a little pig or something for this feast, this day of our greatest joy?"

Aside from the provision of medical care, supplies, and clinical consultation, the health homes are now stressing health education. Motion pictures, lectures, posters, and photographs are used to inform the public. There are also special courses for young villagers in which they get "instruction about the health of their cattle, their crops, their fruit trees, and their poultry." They are also being "introduced to shower baths and proper beds and sleeping quarters. The kitchen and the way it should be kept are also taught."

Besides the courses in hygiene there is instruction in handicrafts such as carpentry, cabinet and basket-making work, thus equipping the young peasants for gainful occupation during the winter months. The need of local libraries, especially during the winter, is evident, and recently some progress has been made in organizing them. Thus we see that the zadruga health home tends to become the cultural center of the community.

Fighting infection at its source through the sanitation of

the peasant home is one of the most important activities of the health zadrugas, the three points of attack being the water supply, the toilets (or rather the lack of them), and the manure piles. With the help of funds from the Serbian Child Welfare Association of America, and from the Ministry of Agriculture, much progress has recently been made. New wells and pumps have been provided, in many cases furnishing running water for the kitchens, and even for the stables. Concrete cesspools with model toilets and concrete pits for manure have been constructed. The demonstration structures by engineers are imitated by the peasants themselves.

Naturally the improvement of home surroundings encourages the improvement of the dwelling house itself. These are as a rule too small, not well ventilated and not easily kept clean. Mr. Radin has reported that, on the basis of a survey in Slovatz in 1932, 95 per cent of the village houses had a height of less than two and a half meters, and that 97 per cent of the population had less than 10 cubic meters of space per person for sleeping quarters.

It was at first proposed to encourage the peasants to imitate certain model homes erected by the Ministry of Health, but better counsel prevailed. The peasants have very strong local traditions in architecture as in other matters, and accordingly the procedure now is to design houses meeting health requirements but preserving the general aspects and character of the houses already existing in the village. Architectural plans, worked out with the assistance of the Central Institute of Hygiene at Belgrade, are given out by the Union of Health Zadrugas.

The improvement of dwellings is one of the important factors in the fight against tuberculosis, widely prevalent in Yugoslavia. Although there have been noticeable results from the educational program of the zadrugas for mothers, the

school children and the general public, antituberculosis work has hardly started on a scale commensurate with the problem. A basic need is accurate information. This is being sought through surveys supervised by the zadrugas. Preliminary surveys of two villages were published in book form for further study in order to develop improved questionnaires and techniques for obtaining and handling the data. Housing, foods and food preparation, occupation, the nature of products, and conditions under which work is done, personal attitudes with respect to customs and superstitions and scientific treatment, economic situations, are among subjects on which information is sought in addition to the more specific subjects concerning disease and exposure to infection.

A few details regarding other specific activities of the zadrugas for which the Serbian Child Welfare Association of America provided funds may be gleaned from a report for 1932. A three-day conference for zadruga doctors was held at the end of March, in the Central Institute for Hygiene, and a ten-day course of instruction was given during July. A tour of inspection of the more advanced zadrugas, lasting seven days, was participated in by fourteen teachers, priests, and other leaders of zadrugas in Dalmatia, South Serbia, and Serbia.

One interesting medium of health education is a traveling exhibition in a railway car attached to a special train which is operated as a traveling agricultural exhibition and school. The health car was equipped by the Union of Health Zadrugas. It contains pictures and models illustrating infant and maternity care, hygienic village homes, sanitation, and the general activity of zadrugas.

A magazine entitled *Health Cooperative Movement* is published at Belgrade by the Union of Health Zadrugas, and a similar review in German is published by a branch of the

Union at Novi Sad. Two books recently published by the Union are SCHOOL AND HYGIENE by Doctor B. Konstantinovich and LIFE AND CONDITIONS IN THE VILLAGE by Doctor Milosavljevich.

The status of the health zadrugas is safe-guarded by law, which provides for a subsidy out of the national budget. This legal protection was obtained after several years of struggle for it. The zadruga can even function as a local official public health department, if so voted by the people concerned, and can thus carry out the public health obligations imposed by the government in a municipality. The National Ministry of Health, efficiently administered under Doctor A. Stampar, cooperates with the zadrugas, and this assures their growing effectiveness in organizing the people themselves to fight disease and to gain a higher degree of positive health.

SICKNESS AND THE DEPRESSION[1]

A PRELIMINARY REPORT UPON A SURVEY OF WAGE-EARNING FAMILIES IN BALTIMORE, CLEVELAND, AND SYRACUSE

by G. St. J. Perrott and Selwyn D. Collins

PRELIMINARY data of an inquiry into the prevalence of sickness as related to changes in income and standards of living during the economic depression were given in a previous report[2]. In that report data were presented for sample populations in Birmingham, Detroit, and Pittsburgh. This paper presents a similar preliminary analysis of the results of the survey in three other cities—Baltimore, Cleveland, and Syracuse. The reader is referred to the first paper for details as to the method and scope of the survey. Briefly, it consisted of a house-to-house canvass of some 12,000 white families in the poorer districts of eight large cities, one group of coal-mining communities, and a group of cotton-mill villages. The records obtained by the canvasses included (a) the economic history of the family in sufficient detail for computing family income for each year from 1929 to 1932, and (b) a record of all illness during the three months immediately preceding the date of the enumerator's visit, in the spring of 1933, with the extent of disability and of medical care for each case.

The sample population in Baltimore, Cleveland, and Syracuse comprised 13,077 individuals in 2,906 families for which the data were sufficiently complete for computing the actual income for each of the four years from 1929 to 1932. The popu-

[1]From the Office of Statistical Investigations, United States Public Health Service, and the Division of Research, Milbank Memorial Fund.

[2]Perrott, G. St. J., and Collins, Selwyn D.: Sickness and the Depression, Milbank Memorial Fund *Quarterly Bulletin*, Vol. XI, No. 4, October, 1933, pp. 281-298; also *Public Health Reports*, United States Public Health Service, October 13, 1933, pp. 1251-1264.

lation did not differ greatly from that of the previous three cities as to occupational composition or nativity and racial stock. Its economic status was somewhat lower than that of the former group, as judged by per capita income in 1932.

ILLNESS AND 1932 INCOME

In Table 1 and Figure 1 the incidence of illness is shown for four groups of the surveyed population classified according to annual per capita income in 1932 to show the relation between economic status and illness as it was found in 1933. Inspection of the table and graph shows a lower illness rate for the higher income groups for illnesses with onset within the survey period. Illnesses with onset prior to the survey period show no relation to income. For illnesses beginning within the survey period, the disabling case rate in the lowest income group (under $150), which comprises 49 per cent of the sample population, is 27 per cent higher and the bed case rate 37 per cent higher than in the group having an annual per capita income of $425 or over. These results are in agreement with those of the surveyed group in Birmingham, Detroit, and

Table 1. Illness and 1932 income. Incidence of illness as related to 1932 family income per capita in canvassed white families in Baltimore, Cleveland, and Syracuse. The group comprised 2,906 families, including 13,077 individuals.

Annual Family Income per capita in 1932	Illness Rate per 1,000 Persons for 3-month Survey Period[1]						Population Observed
	Onset Within Period			Onset Prior to Period			
	Total	Disabling	Bed	Total	Disabling	Bed	
Under $150	173	103	85	97	47	30	6,424
$150–$249	147	85	70	98	45	28	3,048
$250–$424	156	76	61	92	42	25	2,457
$425 and over	155	81	62	105	48	27	1,148

[1]The survey period refers to the three months prior to the enumerator's visit. The canvass in each city required from three to four weeks. The dates of the canvass were slightly different in each city but were between April 1 and May 15 for all three cities.

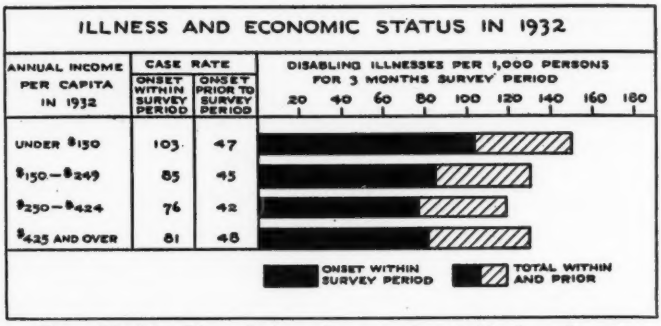

Fig. 1. Disabling illness during a three-month period in the early spring of 1933 in wage-earning families classified according to income per capita in 1932 in Baltimore, Cleveland, and Syracuse.

Pittsburgh and again show that the poor in 1932 are subject to more illness than their more fortunate neighbors in relatively comfortable circumstances.

ILLNESS AND INCOME CHANGE

In the following analysis the individuals have been divided, as in the previous report, into six categories according to economic status in 1929 and 1932.

I. Individuals experiencing lowered family income per capita between 1929 and 1932 were classified as:
   1. Comfortable in 1929 and poor in 1932;
   2. Moderate in 1929 and poor in 1932;
   3. Comfortable in 1929 and moderate in 1932.

II. Individuals who had not experienced lowered family income between 1929 and 1932 were classified as:
   1. Comfortable in 1929 and 1932;
   2. Moderate in 1929 and 1932;
   3. Poor in 1929 and 1932.

The results are given in Table 2 and Figure 2, where it is seen that the highest illness rate was experienced by individuals whose fortunes had suffered the greatest change, namely

the group classified as comfortable in 1929 but poor in 1932. This group, with a rate of 130 per 1,000, showed an incidence of disabling illness 60 per cent higher than the rate (81 per 1,000) of their more fortunate neighbors who were equal in status in 1929 but suffered no drop in income by 1932, that is, the "comfortable in 1929 and 1932" group. The group which dropped from moderate to poor showed a rate of disabling illness 18 per cent higher than the moderate group which experienced no drop in income. The group which dropped from comfortable to moderate shows about the same illness rate as the group which had been in comfortable circumstances throughout the four years. It is interesting to note that the group which might be called the "chronic poor," that is, "poor

Table 2. Illness and change in economic status, Baltimore, Cleveland, and Syracuse, 1929–1932.

Depression History[1]		Case Rate per 1,000 Persons for 3-month Survey Period						Population Observed
		Onset Within Period			Onset Prior to Period			
1929	1932	Total	Disabling	Bed	Total	Disabling	Bed	
I. Individuals with diminished income 1929–1932								
Comfortable	Poor	210	130	92	137	70	38	1,104
Moderate	Poor	168	93	78	88	39	26	3,653
Comfortable	Moderate	151	80	64	105	49	31	2,350
II. Individuals with unchanged income 1929–1932								
Comfortable	Comfortable	157	81	61	103	45	24	1,069
Moderate	Moderate	149	79	66	88	40	24	3,000
Poor	Poor	158	107	95	90	49	34	1,667

[1]Comfortable = $425 and over per capita per year.
Moderate = $150–$424 per capita per year.
Poor = Under $150 per capita per year.

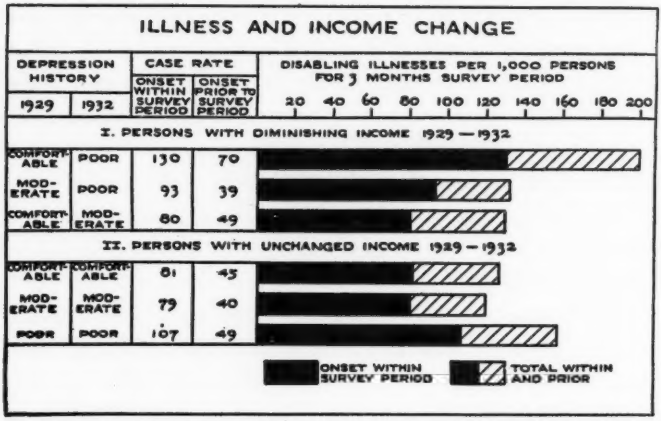

Fig. 2. Disabling illness during a three-month period in the early spring of 1933 in wage-earning families classified according to change in per capita income, in Baltimore, Cleveland, and Syracuse, 1929–1932.

Comfortable=$425 and over per capita per year.
Moderate=$150-$424 per capita per year.
Poor=Under $150 per capita per year.

in 1929 and 1932," showed a lower disabling illness rate (107 per 1,000) than the group which had dropped from comfortable to poor during the depression (130 per 1,000).

These results are in accord with those of the surveyed group in Birmingham, Detroit, and Pittsburgh, namely, that a relatively severe drop in economic status appears to be associated with a high illness rate. The results are generally true for the surveyed group in each of the cities as well as for the total of the six cities.

ILLNESS AND UNEMPLOYMENT

In Table 3 and Figure 3 is shown the relation between unemployment and illness. The surveyed population has been divided into three groups of families having (1) no employed workers, (2) one or more part-time workers but no full-time workers, (3) one or more full-time workers with or without part-time workers. The disabling illness rate among families

Employed Workers in the Family	Case Rate per 1,000 Persons for 3-month Survey Period						Population Observed
	Onset Within Period			Onset Prior to Period			
	Total	Disabling	Bed	Total	Disabling	Bed	
No employed workers	208	126	103	116	64	39	1,786
Part-time workers (1 or more; no full-time)	171	99	84	104	45	30	5,107
Full-time workers (1 or more; 0 or more part-time)	141	76	62	85	41	24	1,846

Table 3. Illness and unemployment, Baltimore, Cleveland, and Syracuse.

having no employed workers (126 per 1,000) is 66 per cent higher than among families having full-time workers (76 per 1,000) and 27 per cent higher than the illness rate in households having part-time workers (99 per 1,000). The group with no employed workers has a higher disabling illness rate (126 per 1,000) than the group with annual per capita income under $150 (103 per 1,000). These results are in agreement with the data previously reported for Birmingham, Detroit, and Pittsburgh.

SUMMARY

Further preliminary analysis of the data of the sickness survey described in the October issue of the *Quarterly Bulletin* has confirmed the results of that report. The present paper gives results of the survey in three additional cities—Baltimore, Cleveland, and Syracuse. Again, it is found that a large drop in economic status is associated with a high rate of illness. These families of the "depression poor" show a rate of disabling illness 60 per cent higher than that of their more fortunate neighbors who suffered no material loss of income from 1929 to 1932, and 22 per cent higher than the rate among

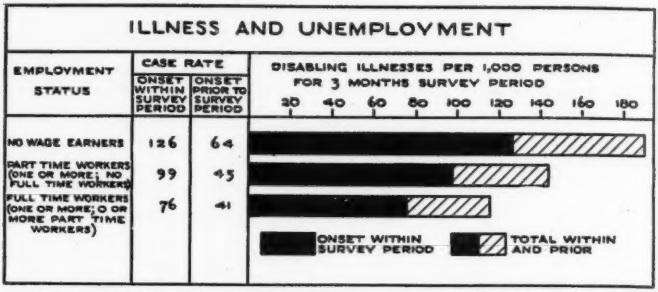

Fig. 3. Disabling illness during a three-month period in the early spring of 1933 in families classified according to the employment of wage-earning members, in Baltimore, Cleveland, and Syracuse.

families of the "chronic poor" who were in a condition of poverty even in 1929. Families of the unemployed have a disabling illness rate 66 per cent higher than families having full-time workers.

It may be noted, moreover, that since illnesses beginning *within* the survey period in the late spring of 1933 are correlated with economic and employment status in 1932 and with changes in economic status during 1929–1932, the possibility that ill health was an important cause of unemployment and thus of lowered income is almost, if not entirely, excluded. In fact, the record of unemployment due to sickness showed that such unemployment was not correlated with changes in economic status.

While discussion of the broad implications of the results must await further study, it can be said that none of the beneficent effects often attributed to the economic depression are evidenced by the data. On the contrary, illness has been most frequent among those who have had to "tighten their belts" most. Final conclusions are reserved until complete analysis of the data has been made, including study of the nature of the illnesses involved, the relative effects at different ages, and a more detailed analysis of the family economic history.

DIETS OF LOW-INCOME FAMILIES IN CLEVELAND, DETROIT, AND SYRACUSE[1]

by DOROTHY G. WIEHL

THE average weekly food supply of families in various low-income groups and of families dependent on relief is presented in this report for about three hundred families in Cleveland, Detroit, and Syracuse. The families were selected at random from those living in the poorer neighborhoods of these cities and were visited by special enumerators who questioned the informant about the food bought and amounts used during one week. In all three cities, the data were collected between April 24th and May 15th. The amount of wages or other income and the sources of income were obtained also for the week for which the food supply was recorded. After classifying the families according to their weekly income per person, the average quantity of various foods or groups of foods was computed for the families in each income group. The quantities represent the family food supply, some of which will be wasted. But no allowance for waste has been made in calculating the average diet and calories because waste is such a variable factor in households and some allowance for waste or margin of safety is included in standards for adequate diet.

The numbers of families in the various income classes in each city are small and may not be entirely typical of fami-

[1]From the Division of Research, Milbank Memorial Fund, and the Office of Statistical Investigation, United States Public Health Service.

This is the second in a series of reports on diets reported by low-income families in nine cities. The first report was on New York City and was published in this *Bulletin*, October, 1933. The data were collected as one part of the study on the health of wage-earning families made by the United States Public Health Service and the Milbank Memorial Fund. The general purpose of the complete study, its other phases and the method were described in the *Quarterly Bulletin* for October, 1933.

Weekly Income per Capita	Number of Families	Number of Persons	Number of Equivalent Adult Males	Calories per Day per Adult Male
Relief families	38	220	167.9	2,320
Less than $2.00	17	121	100.1	2,390
$2.00–$2.99	16	84	72.1	2,710
$3.00–$3.99	12	66	52.8	3,200
$4.00 or more	23	86	70.3	3,380

Table 6. Average calories per day per equivalent adult male in a week's food supply of families of different economic status in Cleveland, Ohio.

lies of similar incomes in the same city. Any comparisons between cities, therefore, should be made with great caution.

CLEVELAND

In Cleveland, diet records were obtained for 106 families. One-third of them received grocery orders from the Associated Charities and the remaining two-thirds were not the recipients of relief during the week for which the food supply was recorded. In about fifty per cent of the families both husband and wife were foreign-born and this proportion held for both relief and non-relief families. Either husband or wife was foreign-born in another 14 per cent of the families, and both were native-born in 38 per cent of the families. One-half of the foreign-born were from Czechoslovakia, Hungary, or Yugoslavia and the remainder from various countries, including Poland, Germany, Finland, and Ireland.

Calories in Diets of Different Income Groups. The average calories per day per equivalent adult male[2] in the diets reported by families of each income class is shown in Table 6.

A diet fully adequate in energy value was reported by

[2]The method of computing the equivalent adult males in a family or group was given in detail in the first report. An adult male aged 18 to 59 years is taken as 100 per cent and relative allowances for other persons are made according to the scale of energy and protein requirements of each sex at different ages compiled by the Bureau of Home Economics of the United States Department of Agriculture.

families with a weekly income of $3.00 or more per person per week. The average number of calories in the food supply reported by families with $2.00 to $3.00 per person was about 10 per cent below the accepted standard of 3,000 calories daily per adult male; and the calories yielded by the diets of families with less than $2.00 per person and also by the diets of relief families were between 2,300 and 2,400 calories or 20 per cent below this standard. In restricted diets for marginal requirements, the allowance for energy value is about 2,700 calories per day for moderately active persons.

Kinds of Foods Purchased. The average supply of each general group of foods and of certain specific foods or classes of foods is given in Table 7 and compared with amounts recommended for an adequate balanced diet, according to modern standards of nutrition. Certain variations and substitutions obviously are possible, but these standard diets are valuable as a guide in evaluating the diets reported. Careful study of Table 7 will give much information concerning the adequacy of certain foods in the diet and the food habits of these families which probably are typical of large groups of the population in similar economic conditions. A few general indications may be referred to.

For families with $4.00 or more per person per week the average consumption of each major group of foods, such as milk, meat and eggs, fats, cereals, sugars, and vegetables and fruits, equalled or exceeded the allowance in the adequate low-income diet.

Families with $3.00 to $4.00 per week, for which the energy value of the diet was adequate, used somewhat less than the recommended minimum quantity of milk and very much less of vegetables other than potatoes, and more than suggested amounts of meat and eggs, cereals, and sugars.

Families in the two low-income classes reported diets which

Type of Food	Pounds per Week per Adult Male					
	Standard Low Income[1]	Relief Families	Weekly Income Per Capita			
			Under $2.00	$2.00–$2.99	$3.00–$3.99	$4.00 or More
Protein Foods						
Milk—quarts	4.5– 5.2	3.08	2.29	2.46	3.71	4.49
Total meats, etc.	1.5– 2.0	1.93	2.05	2.74	3.02	3.75
Meat, fowl, and fish	1.0– 1.5	1.01	1.32	1.78	1.95	2.60
Eggs	.2– .3	.76	.68	.86	.85	1.01
Cheese	.25	.16	.05	.10	.22	.14
Fats and Fat Foods—Total	.8– 1.0	.72	.70	.65	.95	1.09
Lard and subst. fats	.3	.64	.33	.39	.42	.50
Bacon and pork sausage	.3	.06	.06	.03	.21	.11
Butter	.3	.02	.28	.23	.31	.45
Cream			.03		.01	.03
Cereal Foods—Total	5.0– 6.0	3.43	4.75	5.33	6.53	5.99
Flour and cereals		2.78	2.62	2.65	3.31	1.99
Bread		.64	2.01	2.57	3.04	3.85
Cakes and pastry		.01	.12	.11	.18	.15
Sugary Foods—Total	.8– 1.3	1.37	1.40	1.60	1.46	1.45
Sugar and candy	.3– .6	1.04	1.22	1.37	1.30	1.28
Syrup and molasses	.6	.14	.05		.06	.04
Jelly and preserves		.18	.12	.20	.08	.12
Cocoa		.01	.01	.03	.02	
Vegetables and Fruits—Total	8.8–10.0	7.07	6.77	7.66	8.05	11.85
Potatoes	3.5	3.48	4.03	4.30	4.07	4.44
Tomatoes, canned—fresh	1.5	.54	.15	.20	.10	.43
Green leafy vegetables	1.0– 1.3	.77	.41	.48	.60	1.08
Other veg., canned—fresh	1.5– 1.8	.71	.60	.45	.86	1.61
Dried vegetables	.3– .6	.26	.05	.12	.11	.11
Fruits, canned—fresh	1.0	1.08	1.44	1.96	2.21	4.06
Fruits, dried	.3	.23	.09	.15	.10	.17

[1]Derived from data in Miscellaneous Publication No. 113, of the United States Department of Agriculture, April, 1931. Hazel K. Stiebeling and Miriam Birdseye: Adequate Diets for Families with Limited Incomes. The quantities given are sufficient for average requirements for maintenance and growth and furnish some margin of safety.

Table 7. Average weekly supply of various foods per adult male reported by families on relief and by non-relief low-income families in Cleveland, Ohio, 1933.

were on the average 40 to 50 per cent deficient in milk, and about 70 per cent deficient in vegetables other than potatoes, according to the standard for adequate amounts. The consumption of fruit was somewhat above the allowance in the standard diet but not high enough to offset the low consumption of vegetables. These families with very limited money to spend on food had relatively large amounts of sugar, meat and eggs, bread and cereals, used very little dried vegetables or fruits, and reduced the consumption of the "protective" foods, such as milk, green leafy vegetables, and tomatoes to a very low level.

The families receiving grocery orders reported a diet low in all food groups except sugars and meat, fish and eggs but containing more of the "protective" foods than the lowest income families not on relief and therefore with no restrictions in choice of foods. The milk supply of the relief families averaged 30 per cent less than the minimum for an adequate diet and the supply of vegetables other than potatoes about 50 per cent less than the minimum. The consumption of bread, flour, and cereals is unusually low for this type of family, and may be the result of the fact that they were not allowed to buy bread on their food orders. Sacks of flour were distributed to the families, usually bi-weekly or monthly, and it is possible that some families failed to report the use of flour left over from the preceding week. It seems more probable, however, that most of the eleven families which reported neither bread nor flour previously had used all the flour.

Consumption of Milk. The distribution of families according to their weekly milk supply is shown in Table 8. Two-thirds of the families with an income of $3.00 or more per person bought six quarts of fresh milk or its equivalent weekly for each child 16 years of age or less, but only one-third of the families with $2.00 to $3.00 a week had this much milk. One-

fourth of the families in the lowest income class and of those on relief had six quarts or more per child. Two-fifths of the families in the lowest income class and one-fifth of the relief families had less than three quarts per week for each child.

DETROIT

For 91 families in Detroit, the food supply reported for a week has been tabulated according to the income of the family. One-third of the families were dependent on relief and, except for seven families on work relief, they received food orders. Both husband and wife were foreign-born in 50 per cent of the families, one or the other was foreign-born in 10 per cent, and both were native-born in 40 per cent of the families. The proportion of foreign-born families was a little higher (60 per cent) in the relief group than in the higher income non-relief group (40 per cent of the $3.00 or more per person per week group). Many nationalities were represented among the foreign-born, with Italians, Russians, and Poles comprising about 40 per cent of the total foreign-born.

Calories in Diets of Different Income Groups. The average food supply reported by the families in each income class was fully adequate or reasonably adequate to provide the calories

Table 8. Quarts of milk[1] per week per person 16 years of age or less purchased by families in various low-income classes in Cleveland, Ohio.

Weekly Income Per Capita	Number of Families	Per Cent of Families Using Specified Number of Quarts				
		Any Number	0.1–2.9	3.0–5.9	6.0–8.9	9.0 or More
Relief families	38	100.1	21.1	52.6	21.1	5.3
Less than $2.00	17	100.0	41.2	35.3	23.5	0
$2.00–$2.99	16	100.1	18.8	50.0	6.3	25.0
$3.00 or more	33[2]	100.1	6.1	27.3	27.3	39.4

[1]Includes fluid milk and equivalent amounts of evaporated and condensed milk.
[2]Two families in this income class had no children under 17 years of age.

Weekly Income per Capita	Number of Families	Number of Persons	Number of Equivalent Adult Males	Calories per Day per Adult Male
Relief—Food orders	30	169	136.5	2,900
Under $2.00	16	103	79.5	2,630
$2.00–$2.99	12	56	45.5	3,040
$3.00–$3.99	15	90	71.5	3,320
$4.00 or more	18	88	71.7	3,540

Table 9. Average calories per day per equivalent male unit in a week's food supply of families of different economic status in Detroit, Michigan.

needed by moderately active persons. The average calories per day per equivalent adult male are shown in Table 9. The families on relief[3] reported food yielding 2,900 calories per adult male or very close to the standard of 3,000 calories for adequate energy value. The families with less than $2.00 per person per week had a diet yielding 2,630 calories per day.

Kinds of Food Purchased. The food selection by families in the various income groups is shown in Table 10, which gives the average quantity of various foods. The diet of the higher income families contained liberal amounts of all foods except milk, and vegetables other than potatoes. These "protective" foods were used in minimal amounts. The diet of the lowest income families and the relief families contained adequate amounts of all foods except milk and vegetables. The average consumption of milk was 40 to 50 per cent less than the amount recommended for low-income diets, and the use of all vegetables other than potatoes was about 25 per cent below the minimum quantity recommended.

Consumption of Milk. The milk supply for children under 17 years of age for families of different incomes is shown in Table 11. The use of milk increased greatly when income was

[3]Diets of families on home-relief and on work-relief are not shown separately because the seven work-relief families had a food supply very similar to that of the home-relief families.

Type of Food	Pounds per Week per Adult Male					
	Standard Low Income[1]	Relief Families	Weekly Income Per Capita			
			Under $2.00	$2.00–$2.99	$3.00–$3.99	$4.00 or More
Protein Foods						
Milk, fresh and canned, qts.	4.5– 5.2	2.59	2.14	2.98	3.12	3.15
Total meat, eggs, cheese	1.5– 2.0	2.32	2.64	2.69	3.81	4.10
Meat, fowl, and fish	1.0– 1.5	1.32	1.97	1.63	2.80	2.86
Eggs	.2– .3	.89	.50	.99	.90	1.03
Cheese	.25	.11	.17	.07	.11	.21
Fats and Fat Foods—Total	.8– 1.0	1.12	.85	1.29	1.18	1.40
Lard and substitutes	.3	.72	.56	.71	.61	.56
Bacon and pork sausage	.3	.14	.07	.34	.18	.23
Butter	.3	.26	.22	.24	.38	.56
Cream					.01	.05
Cereal Foods—Total	5.0– 6.0	5.65	5.29	5.55	5.27	6.22
Flour and cereals		2.39	2.64	2.42	2.49	2.41
Bread		3.20	2.55	2.91	2.80	3.49
Cakes and pastry		.06	.10	.22	.28	.32
Sugary Foods—Total	.8– 1.3	1.30	1.02	1.21	1.63	1.73
Sugar and candy	.3– .6	1.06	.86	1.02	1.31	1.31
Syrup and molasses	.6	.11	.12	.08	.15	.18
Jelly and preserves		.11	.03	.09	.13	.19
Cocoa		.02	.01	.02	.04	.04
Vegetables and Fruits—Total	8.8–10.0	8.54	7.63	10.49	10.91	9.63
Potatoes	3.5	4.59	3.96	4.23	4.38	3.82
Tomatoes, canned—fresh	1.5	.47	.57	.59	.54	.45
Green leafy vegetables	1.0– 1.3	.62	.57	1.14	1.17	1.07
Other veg., canned—fresh	1.5– 1.8	1.20	1.19	1.45	1.68	1.35
Dried vegetables	.3– .6	.19	.05	.24	.15	.08
Fruits, canned—fresh	1.0	1.31	1.16	2.75	2.85	2.70
Fruits, dried	.3	.16	.13	.09	.14	.15
Miscellaneous		.01	.03	.01	.03	

[1]See footnote to Table 7.

Table 10. Average weekly supply of various foods per adult male reported by families on relief and by non-relief low-income families in Detroit, Michigan.

more adequate and slightly over 50 per cent of the families with $3.00 a week had six quarts or more per week for each child, while not quite 20 per cent of those with less than $2.00 per week had six quarts per child. A considerably larger proportion of the relief families had three quarts or more weekly for each child than of the lowest income families. Nevertheless, the children in one-fourth of the relief families and the children in three-fourths of the lowest income families had less than three quarts of milk.

SYRACUSE

Data on the food supply of 98 families in Syracuse were collected and tabulated according to the economic status of the family. There were 42 families receiving relief of which 26 were on emergency work relief and received a wage and 16 received food orders. In about 40 per cent of the families both husband and wife were foreign-born, in 20 per cent either husband or wife were foreign-born and in 40 per cent both were native-born. Slightly more than one-half of the foreign-born were Italians, and another one-fourth were from Russia or Poland. There were proportionately more of the native-born families in the relief group and in the relatively high income group than in the lower income groups.

Table 11. Quarts of milk[1] per week per person 16 years of age or less purchased by families in various low-income classes in Detroit, Michigan.

Weekly Income Per Capita	Number of Families	Per Cent of Families Using Specified Number of Quarts				
		Any Number	0.1–2.9	3.0–5.9	6.0–8.9	9.0 or More
Relief families	30	100.0	26.7	53.3	16.7	3.3
Less than $2.00	16	100.1	43.8	37.5	12.5	6.3
$2.00–$2.99	12	99.9	8.3	75.0	8.3	8.3
$3.00 or more	33	99.9	9.1	33.3	33.3	24.2

[1]Includes fluid milk and equivalent amounts of evaporated and condensed milk.

Weekly Income per Capita	Number of Families	Number of Persons	Number of Equivalent Adult Males	Calories per Day per Adult Male
Relief—Food orders	16	85	64.8	2,300
Relief—Wage	26	163	122.2	2,860
Under $2.00	17	112	86.4	2,680
$2.00–$2.99	12	70	55.0	2,690
$3.00–$3.99	5	23	18.0	3,130
$4.00 or more	22	90	71.8	3,430

Table 12. Average calories per day per equivalent adult male in a week's food supply of families of different economic status in Syracuse, New York.

Calories in the Diets of Different Income Groups. The calories afforded by the average diet of families in various income groups are shown in Table 12. For families on food relief, the calories averaged 2,300 per adult male per day or about 23 per cent below the standard of 3,000 calories for energy requirements. Families on work relief reported a diet only about 5 per cent low in calories. The energy value of the diets of families with less than $3.00 per person per week was about 10 per cent below the 3,000 calories recommended as a minimum and that of families on higher incomes was above this standard.

Kinds of Food Purchased. A general indication of the balance in the diet of families in different income classes and of the adequacy of the supply of certain foods may be obtained from Table 13 in which is shown the average supply of various groups of foods.

The home-relief families reported a diet somewhat lower in the quantity of all major foods except sugar, eggs, and potatoes than the minimum allowance in the adequate low-income diet. The consumption of milk by this group was 20 per cent lower than that recommended for adequate diets but it was much higher than that by the work-relief families or by other low-income families. This relatively high consumption of milk,

Type of Food	Pounds per Week per Adult Male						
				Weekly Income Per Capita			
	Standard Low Income[1]	Home Relief	Work Relief	Less than $2.00	$2.00–$2.99	$3.00–$3.99	$4.00 or More
Protein foods							
Milk—qts.	4.5– 5.2	3.58	2.76	2.42	2.40	3.40	3.57
Total meat, etc.	1.5– 2.0	1.21	2.15	1.84	2.81	3.36	4.18
Meat, fowl, fish	1.0– 1.5	.75	1.54	1.08	1.84	2.05	2.81
Eggs	.2– .3	.38	.53	.62	.82	1.17	1.17
Cheese	.25	.08	.08	.14	.15	.14	.20
Fats and Fat Foods—Total	.8– 1.0	.75	.94	.93	1.01	1.01	1.51
Lard and subst.	.3	.26	.56	.67	.67	.52	.52
Bacon and pork sausage	.3	.07	.05	.02	.04	.05	.18
Butter	.3	.42	.31	.24	.30	.44	.59
Cream			.02				.21
Cereal Foods—Total	5.0– 6.0	4.66	5.52	5.47	4.83	6.19	5.92
Flour and cereals		1.85	2.80	2.54	2.69	1.74	2.65
Bread		2.71	2.54	2.86	2.08	4.30	2.93
Cakes and pie		.10	.18	.07	.06	.15	.34
Sugary Foods—Total	.8– 1.3	.83	1.29	1.21	.98	1.25	1.34
Sugar and candy	.3– .6	.79	1.21	1.06	.90	1.17	1.18
Syrup and honey		.02	.04	.02			.05
Jelly and preserves			.01	.04	.03		.09
Cocoa		.02	.03	.09	.05	.08	.02
Vegetables and Fruits—Total	8.8–10.0	7.50	8.84	8.70	8.75	8.23	10.91
Potatoes	3.5	4.02	5.90	5.12	3.68	4.38	3.57
Tomatoes, canned—fresh	1.5	.67	.41	.44	.35	.67	.75
Green leafy vegetables	1.0– 1.3	.75	.74	.80	.66	.83	1.20
Other veg. canned—fresh	1.5– 1.8	1.10	.62	.48	1.51	.29	1.38
Dried vegetables	.3– .6	.21	.18	.16	.19	.17	.08
Fruits—canned or fresh	1.0	.64	.87	1.68	2.34	1.78	3.83
Fruits—dried	.3	.11	.12	.02	.02	.11	.10
Miscellaneous		.07	.07	.02	.05		.02

[1]See footnote to Table 7.

Table 13. Average weekly supply of various foods per adult male reported by families on relief and by non-relief low-income families in Syracuse, New York, 1933.

together with a fairly good supply of tomatoes and leafy vegetables gives this diet a balanced although low nutritive value.

The work-relief families had a diet adequate in most foods but low in milk and in vegetables, except potatoes, and fruits,

Weekly Income Per Capita	Number of Families[2]	Per Cent of Families Using Specified Number of Quarts				
		Any Number	0.0–2.9	3.0–5.9	6.0–8.9	9.0 or More
Home-relief	13	100.1	15.4	46.2	23.1	15.4
Work-relief (wage)	24	100.0	20.8	75.0	4.2	0
Less than $2.00	16	100.0	43.7[3]	43.7	6.3	6.3
$2.00–$2.99	11	100.0	27.3	54.5	18.2	0
$3.00 or more	22	99.9	4.5	50.0	22.7	22.7

[1]Includes fluid milk and equivalent amounts of evaporated and condensed milk.
[2]Twelve families had no children under 17 years of age.
[3]One family in this income class had no milk, all families in other classes had some milk.

Table 14. Quarts of milk[1] per week per person 16 years of age or less purchased by families in various low-income classes in Syracuse, New York.

and therefore not well provided with the protective foods most useful in maintaining good nutrition, especially for children.

The low-income families not receiving relief had a diet similar to that of the work-relief families but somewhat lower in the amount of milk.

Families with $4.00 or more per person per week had a liberal amount of all foods except milk and vegetables and these were represented fairly well in the diet.

Consumption of Milk. The proportion of families of different income using various amounts of milk is shown in Table 14. This table brings out more specifically than Table 13 that the home-relief families were generally well supplied with milk and that only families with $3.00 or more per person were as adequately supplied. The work-relief families used more milk than the non-relief families of corresponding low income[5] but among non-relief families the use of milk increased definitely with income.

[5]The average income of work-relief families was $1.75 per person per week.

TUBERCULOSIS IN A RURAL POPULATION

THE PREVALENCE OF CHEST PATHOLOGY AS REVEALED BY X-RAY OF A RANDOM SAMPLE IN CATTARAUGUS COUNTY

by JOHN H. KORNS, M. D.[1]

THIS article summarizes the chest X-ray findings in a series of health examinations conducted on 846 individuals from the farms and villages in the central part of Cattaraugus County, New York. The chest X-ray examinations were made primarily as a part of an epidemiological investigation of tuberculosis in a rural area, which is being carried on through the cooperation of the Milbank Memorial Fund, the United States Public Health Service, and the County Department of Health. Inasmuch as Sydenstricker and Downes[2] in a recent issue of the *Quarterly Bulletin* have described the geographical area included in the survey, the character of the population sample examined as well as the circumstances which brought them in for the examination, these points need not be detailed here. It is sufficient to say that the group examined represents rather well a random sample of the population of the geographical area under consideration and that the group constitutes about 17 per cent of this population.

It was not thought at the beginning of the investigation that the X-raying of such individuals would uncover much new tuberculosis. This supposition was based upon extensive tuberculin testing by the Bureau of Tuberculosis and examinations in diagnostic clinics over a period of ten years. Consequently the small number of significant lesions which this

[1]From the Cattaraugus County Department of Health and the Division of Public Health Activities of the Milbank Memorial Fund.

[2]Sydenstricker, Edgar and Downes, Jean: The Prevalence of Tuberculous Infection in a Rural Community in New York State. The Milbank Memorial Fund *Quarterly Bulletin*, July 1933, xi, pp. 221–232.

paper has to report, as resulting from the X-raying of chests, is not surprising or disappointing. It is only corroborative and gratifying. At the same time the fact should not be lost sight of that the Milbank Memorial Fund has been willing to finance the examinations in order to make a certainty out of what had been merely a probability.

As to technique, stereoscopic postero-anterior films were taken of practically all but infants and extremely small children. For these latter single films were made. The exposures were done uniformly at 48 inches for 1/10 second, with a Coolidge universal 100 milliamper tube, and the kilovoltage was varied with the chest depth, calipers being used to measure the chest. Only those films that were of satisfactory quality were included in this study. The films were read by Dr. Korns. Many of them were reviewed independently by Dr. Ralph Wheeler, and doubtful ones were sent to Dr. F. M. McPhedran who very kindly gave an opinion.

Table 1 shows the distribution of those X-rayed by sex and by age groups. A fairly satisfactory number were X-rayed in

Table 1. Age and sex distribution of the 846 individuals X-rayed.

Age Groups	Number			Per Cent		
	Both Sexes	Male	Female	Both Sexes	Male	Female
ALL AGES	846	372	474	100.0	100.0	100.0
0– 9	191	91	100	22.6	24.5	21.1
10–19	185	86	99	21.9	23.2	20.9
20–29	93	34	59	11.0	9.2	12.4
30–39	97	36	61	11.5	9.7	12.9
40–49	114	45	69	13.5	12.1	14.6
50–59	84	36	48	9.9	9.7	10.1
60–69	52	24	28	6.2	6.5	5.9
70–79	23	16	7	2.7	4.3	1.5
80 Plus	6	3	3	.7	.8	.6
Age Unknown	1	1	0			

Type of Lesion	Age Groups									
	All Ages	0–9	10–19	20–29	30–39	40–49	50–59	60–69	70+	Age Unknown
TOTAL LESIONS	59	1	6	8	6	18	11	5	5	0
Adult Type: (Pulmonary)										
Minimal	7	0	0	0	0	3	3	0	1	0
Moderately advanced	1	0	0	0	0	0	1	0	0	0
Advanced	1	0	1	0	0	0	0	0	0	0
Childhood Type:										
Calcified nodules in the lung	15	0	1	2	2	4	3	3	0	0
Tuberculosis of the tracheobronchial lymph nodes—calcified	11	1	1	1	0	4	2	1	1	0
Both calcified nodules in the lung and calcified tracheobronchial lymph nodes	24	0	3	5[1]	4	7[1]	2	1	2	0
TOTAL INDIVIDUALS X-RAYED	846	191	185	93	97	114	84	52	29	1

[1]In one case the films indicated only partial calcification at the hilum.

Table 2. Type of tuberculous lesions discovered by X-raying 846 individuals, according to age.

each age group up to 70. The fact that the females predominate among the adults examined was almost unavoidable in a community chiefly agricultural.

Inasmuch as the films were taken primarily to determine the prevalence of discoverable tuberculosis in the chest, the data on this point are presented first. Table 2 gives this information by age groups.[3] The first three horizontal divis-

[3]Since it was desired to determine the amount of tuberculosis in a random sample of the resident population in a rural area, one individual who reported for the health examination and was diagnosed as moderately advanced pulmonary tuberculosis has been excluded. This individual, a man 28 years of age, had recently come from Buffalo into the area under consideration and remained there less than 6 months. He asked especially to have the health examination because he knew he had definite symptoms of tuberculosis. He should have been directed to the regular diagnostic clinic in the district instead of being examined in a clinic where the bases of selection of families were the general interest in health and the willingness to have an examination which included the tuberculin test. Consequently, it seems quite proper to exclude this case

(continued on page 50)

ions in the table show lesions of the adult type as classified by the National Tuberculosis Association. The last three illustrate primary lesions of the so-called childhood type, classified according to suggestions made to the writer by Dr. E. L. Opie.

Fifty-nine individuals showed some X-ray evidence of tuberculosis infection, but in 50 of these there were only calcified pulmonary nodules or tracheo-bronchial lymph nodes or both. In none of the 50 had any illness been attributed to tuberculosis and no history of illnesses suggestive of this disease was obtained. It was evident that these 50 had taken care of their lesions without any invalidism, and without the development of the adult type of lesion. Nine showed X-ray evidence of the adult type of tuberculosis, but in seven of these no history could be elicited that indicated clinical evidence of tuberculosis. In all of these seven the lesions were classed by X-ray as minimal and they appeared to be healed. The one moderately advanced case was apparently cured. The one advanced case was active and this patient had been under some medical observation before this examination.

In the entire group of 846, therefore, only one active case of pulmonary tuberculosis was found by X-ray, although a total of 59 showed by this method evidence of past tuberculosis infection.

Of the nine diagnosed as being of the adult type, eight, or 89 per cent, were males, although only 44 per cent of those X-rayed were males. It is interesting to note that only seven of the 59 diagnosed, or 11.9 per cent, were under 20 years of age although 44 per cent of those X-rayed were under 20. This confirms previous observations of the writer to the effect that in this county recognizable lesions usually develop after

since he was not an actual resident of the population being studied and sought the examination because of definite symptoms of tuberculosis.

adolescence. At the same time it should be kept in mind that the single advanced lesion found was in a boy only 17 years old.

Besides this there were five sets of films showing either a doubtful pulmonary nodule or a doubtful calcified area in the region of the tracheo-bronchial lymph nodes.

No attempt was made to record the results of the tuberculin tests for the series as a whole since they do not lie within the scope of this paper but one very interesting finding was that out of the fifty diagnosed by X-ray as showing calcified nodules or tracheo-bronchial lymph nodes, ten showed no reaction to 1.0 mg. of Old Tuberculin given intradermally. Eight of these non-reactors were over 40 years of age. This corresponds with our previous experience in this county, where casual tuberculosis infection seems light, in that we have found in several instances in middle age or later incontrovertible X-ray evidence of calcification, in the presence of a negative reaction to 1.0 mg. of standardized Old Tuberculin intradermally. Only about one-third of those diagnosed reacted to 0.01 mg. of Old Tuberculin, a larger dosage being required in the remainder.

Some attention was devoted to abnormalities in the films that might be ascribed to causes other than tuberculosis. These abnormalities are grouped roughly in Table 3.

The abnormalities tabulated will be commented upon in the above order.

Increased lung markings. This term was applied to exaggerations of normal markings whether local or general and was not used to cover homogeneous densities. It was thought that in adults obesity might be a factor in causing thin films and so the appearance of increased markings. It was found that very few under age 20 were more than 10 per cent overweight, as reckoned by standard tables. Of the 469 over age 20 who were X-rayed the overweight group numbered eighty-

Age Groups	Total X-rayed	Increased Lung Markings	Enlarged Heart or Aorta	Other Causes of Wide Mediastinal Shadow	Thickened Pleura	Bronchiectasis	Convalescent Pneumonia	Calcified Plaque in Aorta	Pulmonary Infarct	Rib Anomalies
ALL AGES	846	96	37	8	7	2	2	5	1	5
0–20	376	14	3	3	1	0	0	0	0	3
20–39	190	46	3	3	1	1	0	0	0	0
40+	279	36	31	2	5	1	2	5	1	2
Age unknown	1	0	0	0	0	0	0	0	0	0

Table 3. Evidence of pathology, other than tuberculosis in 850 chests X-rayed.

nine or 19 per cent. Of the eighty-two over age 20 who showed increased lung markings twenty or 24 per cent were in the overweight group. This difference of 5 per cent is slight and may not be significant. If the films are read objectively the interpreter might occasionally suspect pathology in or around the bronchioles in some of the obese patients, but when due allowance is made for the increased chest thickness such films can usually be properly evaluated.

It was thought too that a history of previous chest trouble might be elicited more frequently from those who showed increased markings than from those not showing this feature, but such was not the case. In fifteen, or 15 per cent, of ninety-six showing such markings there was a history of previous chest trouble. In five of these there had been pneumonia, and in two chronic heart disease. In the entire group of 846 X-rayed 167, or 19 per cent, gave a history of previous chest trouble, subdivided as follows: pneumonia 81, influenza 45, repeated colds with cough and sputum 11, repeated bronchitis 10, pleurisy 10, sinusitis 4, asthma 3, chronic heart trouble 2. In this connection it should be stated that no relationship between tuberculosis and previous chest trouble was noted.

One further fruitless effort was made to account for increased lung markings. The pathology of the nose, mouth, and pharynx was recorded and it was found in the group of ninety-six with increased markings that twenty-nine, or 30 per cent, showed carious teeth, ten, or 10 per cent, deviated septum, twenty-three, or 24 per cent, enlarged tonsils, and five, or 5 per cent, enlarged turbinates. In the entire group of 846, 329, or 38 per cent, showed carious teeth, 88, or 10 per cent, deviated septum, 258, or 30 per cent, enlarged tonsils, and 46, or 5 per cent, enlarged turbinates. Ninety had no natural teeth and 75 had had tonsillectomy. And it is fair to assume that these had shown pathology in previous years. They were so distributed as not to change the ratio appreciably.

It would seem in this series then, that there is little if any evidence pointing to obesity as a cause of increased lung markings and that previous chest trouble or present pathology in the oral and nasal passages are neglibible factors in the production of such markings. Table 3 shows clearly the importance of age as a factor. Of 376 X-rayed under age 20 only fourteen, or less than 4 per cent, showed increased markings, while of 469 X-rayed over age 20, eighty-two, or 17 per cent, showed such markings.

Other abnormalities found need not be commented upon at length. Thirty-two showed decided enlargement of the heart shadow or widening of the aortic shadow or both. Several of these gave histories and corroborating findings of organic heart disease. Eight showed wide upper mediastinal shadows due to persistent thymus in three, substernal thyroids in four and to a malignant mediastinal tumor in one. Seven showed thick pleura. Bronchiectasis was found in two, localized densities due to convalescent pneumonia in two, calcified plaques in the aorta in five, pulmonary infarct in one, cervical ribs in four, and fusion of the anterior ends of two ribs in one case.

DISCUSSION

The above data would seem to have distinct value in that they reveal a very small amount of active or clinically important tuberculosis of the lungs in the community under consideration. Only one active case was found among the 846 who had chest X-ray examinations. These data also furnish a basis for estimating the actual prevalence of active tuberculosis in the rural part of Cattaraugus County. In addition to the one case discovered there should be added the proportionate number of active cases known within the 5,000 population from which the 846 were drawn, or one case, making a total prevalence of two.[4] If this prevalence be applied to the rest of the County's rural and village population, numbering approximately 40,000 (exclusive of reservation Indians), there should be ninety-four active cases. The Bureau had actually sixty-nine active cases on the roster, or 73 per cent of the estimated prevalence. If this estimated prevalence be accepted as a reasonably accurate approximation to the actual prevalence of active tuberculosis, the fact that 73 per cent of the cases were known indicates a high degree of attainment in case finding and reporting in Cattaraugus County.

The annual death rate from all forms of tuberculosis in this rural and village district of 40,000 people averaged 33 per 100,000 for the past five years, but it is gratifying to note that the number of deaths has markedly decreased during this period. In 1928 there were 19; in 1929, 21; 1930, 12; in 1931, 8, and in 1932, 6. So the finding of so little active tuberculosis in a sample of the population under discussion is quite

[4]As stated in the study reported upon by Sydenstricker and Downes (*op. cit.* 2) none of the four families with known active tuberculosis was asked to have the special health examination. If we assume these cases to be evenly distributed among the 5,000 population, in any sample of 846 drawn at random we should expect to have one known case of tuberculosis.

consistent with a rapidly decreasing death rate from the disease in this area.

Also interesting and significant is the fact, brought out in Sydenstricker's and Downes' paper referred to above, that tuberculosis infection takes place mostly after adolescence in the area under consideration. The X-ray findings in the sample group here reported are consistent with the above report on tuberculin tests in that they show six times the number of lesions in those over age 20 as compared with those under 20. In spite of the large increase in discoverable lesions over age 20 there is no evidence that post-adolescent primary infection is not borne as well as childhood primary infection. The calcified areas in the lungs and tracheo-bronchial lymph nodes appear to remain calcified and no new lesions appear to develop. The weak response to tuberculin in adults mentioned in this paper, by a number of those showing calcification, would indicate probably a light primary infection and a healing of the lesion.

SUMMARY

In summary the chests of 846 individuals, representing a cross-section of a rural and village community, were X-rayed. The amount and type of tuberculosis found is recorded, and other pathological findings in the films are noted.

A total of fifty-nine persons showed some X-ray evidence of tuberculosis infection, fifty of these illustrating the primary or childhood type, which apparently was of no clinical significance. The remaining nine showed secondary or adult types of lesions, but of these nine only two had had symptoms referable to their pulmonary trouble, and only one was considered active. Only one of these nine was under 20 years of age. Those over 20 showed six times as many tuberculosis lesions of all types as did those under 20. The adult type of

lesion was found prevailingly in males. A relatively large number of those over 40, showing X-ray evidence of calcification, failed to respond to diagnostic doses of Old Tuberculin.

No correlation of significance was noted between heavy lung markings seen in the film on the one hand, and obesity, previous chest trouble, or present pathology of the oral and nasal passages on the other. These markings increased definitely with age.

The net result of importance, therefore, of the chest X-ray examinations, was to prove that serious tuberculosis is rare in the population group studied. This confirms impressions derived from negative symptomatology and physical findings in the group examined and also from previous intensive search for tuberculosis in the same geographical area.

EFFECTIVENESS OF BIRTH CONTROL

A STUDY OF CONTRACEPTIVE PRACTICE IN A SELECTED GROUP OF NEW YORK WOMEN[1]

REGINE K. STIX, M.D. AND FRANK W. NOTESTEIN

ONE of the questions which constantly arise in discussions of specific conditions which might affect the birth rate is this: To what extent does birth control really affect the pregnancy rates and ultimately the reproduction of various classes of the population? Students of population have indulged for many years in academic and rather futile speculation as to the potency of numerous influences that may be responsible for the declining birth rate and for differences in the birth rates among social groups. Obviously what are needed are factual studies of a scientific nature.

This paper presents the preliminary results of an inquiry which, it is hoped, will throw some light on the effectiveness of contraceptive practice for a selected group of people. It should be emphasized that the group which forms the subject of this inquiry is not a random sample of the population. It is comprised of married women who, for one reason or another, showed sufficient interest in the limitation of their families to attend a birth control clinic. Since most of them practiced some form of contraception at some time before they came to the clinic, the record of their experience affords an opportun-

[1]From the Division of Population Problems, Milbank Memorial Fund. Acknowledgments are gratefully made to Mrs. Margaret Sanger, director, Dr. Hannah M. Stone, medical director, and the staff of the Birth Control Clinical Research Bureau, New York City. Without their cooperation in permitting access to records and assisting in the routine of contact with patients, this study would have been impossible.

We are also greatly indebted to Professor Raymond Pearl, The Johns Hopkins University, for his method of computing pregnancy rates and for advice given us in the course of this study.

ity of studying *for this kind of group* the effectiveness of untutored efforts at birth control. The purpose of this paper is, therefore, to study the extent to which these women used contraceptive measures *before* receiving special instruction at a birth control clinic, and the effectiveness of such measures when used.

THE GROUP STUDIED

Our data are derived from the records of 714 women who came to the Birth Control Clinical Research Bureau from the Borough of the Bronx, New York City, in 1931, and were still living in that borough about a year and a half later.[2] The records were secured by a physician (Dr. Stix) who came as an accredited representative of the clinic to interview each woman in her home.

The fact that the women were patients of a birth control clinic sets them apart from the general population as a group especially interested in family limitation. On the whole, they appear to be more fertile than women who do not attend such a clinic. Although they had been married an average of less than ten years, they had had an average of 3.23 pregnancies and 2.26 live births in this time. They are not so fertile as the patients of the Baltimore Bureau for Contraceptive Advice[3] but they differ from both the Baltimore group and from the general population in many ways. Two-thirds of the women are Jewish, one-sixth Catholic, and only one-tenth Protestant. Almost all of them have lived in New York City since their marriage, but more than half are foreign-born and only one-sixteenth native-born of native parents. They represent for the most part middle and working class families whose annual

[2]The period of married life included in this study ends with each woman's first contact with the clinic.

[3]Pearl, Raymond: Statistical Report on the Fifth Year's Operation of the Bureau for Contraceptive Advice. Baltimore, 1933, p. 8.

incomes in 1929 ranged from $400 to $20,000, with a median income of $2,300. In 1932 the median income had dropped to $1,200, about a fifth of the families were destitute or supported by organized relief, and the highest income was less than $6,000.

TYPES AND EXTENT OF CONTRACEPTIVE PRACTICE

There is further evidence of an expressed interest in birth control in the fact that before they attended the clinic 95 per cent of these women had made some effort to limit their families by the practice of what they believed to be contraception.[4] Forty per cent of the families in the group used contraceptives immediately after marriage and an additional 40 per cent started their use at some time before the beginning of the second pregnancy. Table 1 shows the frequency distribution of the contraceptive methods used, based on the number of times each was reported, regardless of the length of time any one method was practiced. There is an average of 1.8 methods for each couple, since some couples used two methods simultaneously and some used different methods at different times. The two methods most frequently used by the husband comprise about two-thirds of all those reported; the remaining methods were those for which the wife was responsible.

METHOD OF COMPUTING PREGNANCY RATES

In order to answer the question: How effective is contraception when and as practiced by this group of women?—it is necessary to compare their experience while using contra-

[4]The term *contraception* includes any method used by husband or wife, with the exceptions of voiding after coitus, regular use of cathartic or abortive drugs before the onset of each menstrual period, or lactation when regarded as safe period. The latter exception was made necessary because if lactation were regarded as a contraceptive only when so specified, the same behavior would have been classified both as contraception and no contraception.

ceptives with their experience while using none. This involves computing the rate at which they became pregnant for each type of experience. The general method first presented by Pearl[5] seems the one best suited to our purpose. Briefly, this method of computing rates consists in relating the number of pregnancies experienced by each woman to the time during which she could have become pregnant,

Table 1. Number of times each contraceptive method was reported.

Type of Contraceptive	Number	Per Cent
Total	1,290	100.0
Type unknown	2	0.2
Coitus interruptus	430	33.3
Douche	301	23.3
Condom	417	32.3
Vaginal suppository	77	6.0
Other (includes safe period,[1] pessary, cervical cap, jelly, sponge, intrauterine device, etc.)	63	4.9

[1]Only specific period within a given menstrual cycle. Lactation not included.

[5]Pearl, Raymond: Contraception and Fertility in 2,000 Women. *Human Biology*, Baltimore, Maryland, iv, No. 3, September 1932, p. 400 ff.

Pearl's rates are based on the assumption that: "A woman past puberty but not past the menopause is assumed to be exposed to the risk of becoming pregnant when she is more or less regularly indulging in sexual intercourse as in the married state . . . (and) . . . is not exposed to the risk of becoming pregnant during those periods of time when she is already pregnant." He therefore takes the total elapsed period of married life for each woman in his sample and deducts therefrom a fixed period for each pregnancy. The time remaining he classifies as "exposure to the risk of pregnancy." Adding together in one column the years exposed to pregnancy for all the women in his sample, and in the adjacent column the number of pregnancies experienced by all these women within the related time, he computes from the two totals a rate, which he designates as "pregnancies per person-year of exposure to risk of pregnancy." This rate multiplied by 100 gives his working rate, which is number of pregnancies per 100 person-years of exposure to the risk of pregnancy. We have used this method of computing rates rather than the later one devised by Professor Pearl, which expresses the pregnancy rate as the number of pregnancies per 100 estimated ovulations. (*The Lancet*, September 9, 1933, p. 607.) The frequency of ovulation in lactating women is open to question. Pearl's material is so classified that the proportion of lactation in his two groups of women may be assumed to be approximately the same. In our material, however, the proportion of time spent in lactation varies widely in the three classifications used and ovulation cannot therefore be introduced as a constant.

which he calls "exposure to the risk of pregnancy." This involves the exclusion of time pregnant from exposure. We have therefore deducted from the number of months which had elapsed since each woman's first marriage the actual number of months during which she was pregnant, and an additional month or fraction of a month for each pregnancy[6] to allow for time spent in the puerperium. We have also deducted all periods of separation or abstinence of more than two months' duration, including the period or periods between marriages, when the woman was married more than once. This eliminates the necessity of considering marriages separately.[7]

Since our ultimate goal is to compare the pregnancy rates

[6]Pregnancy in every case refers to all live births, stillbirths and premature deliveries excepting those abortions which were of less than two months' gestation, undiagnosed by a physician, not induced by instrumental interference and not followed by dilatation and curettage. These exceptions are largely the so-called drug abortions. In a few selected cases in which the woman was a known luetic or had previously shown a marked tendency to frequent spontaneous abortion, these questionable abortions were counted as pregnancies.

Ten months were deducted for each full term live or stillbirth; a month or part of a month in addition to known period of gestation for each abortion or premature birth. That is, if a woman reported an abortion at six weeks' gestation, we deducted two months for that pregnancy, if she reported an abortion at three months' gestation, we deducted four months for the pregnancy.

Since our unit of time is one month, all exposures of less than one month have been entered as one month; that is, if a woman bore a child nine months after marriage, one month of exposure was entered in the column related to this pregnancy in spite of the fact that she had obviously been exposed to the risk of pregnancy for less than one month before becoming pregnant.

[7]For purposes of analysis we must assume throughout this study that for this group of women sexual intercourse is confined to marital intercourse, unless we have specific information to the contrary.

Thirty-one women in the group were pregnant at marriage. Since we could not compute the length of time they were exposed to the risk of pregnancy before premarital conception and we did not know whether or not contraceptives were habitually used before these conceptions took place, their entire pregnancy-exposure record is excluded from Table 2.

For twenty-seven women we had a notation for one or more pregnancies that contraceptive practice had been interrupted in order to bring about pregnancy, but no record of the number of months of exposure without contraceptives

(continued on page 62)

exhibited by women while practicing contraception with those when no contraceptive was used, it was necessary to secure details relating to the use or non-use of contraceptives prior to each conception. On the basis of this information, we have classified each woman's exposure to the risk of pregnancy into three categories: first, time when contraception was practiced more or less habitually; second, time following habitual use of contraceptives, during which these practices were temporarily omitted (because the couple desired to have a child), and third, time during which the couple habitually used no contraceptive[8] (usually from marriage until habitual contraceptive practice was started,—after the termination of the first or a later pregnancy).

At first glance, it would appear that we should consolidate the second and third types of experience, since the sum of them is the total exposure during which no contraceptives were used, and compare the pregnancy rates for this total exposure with the rates when contraceptives were used. More careful consideration of the problem, however, makes it clear that this will not measure the true effectiveness of contraception as practiced, since the only type of experience in which lactation cannot be present is that of women who temporarily interrupt contraceptive practice in order to have a baby. To the extent that lactation or associated physiological factors may prevent conception, this experience is limited to

which elapsed before conception took place. Three months of exposure were allowed for each of these pregnancies. This represents the average number of months of non-contraceptive exposure in all similar known cases, computed by duration of marriage groups. As will be seen in Table 3, there is apparently no significant difference between duration of marriage groups in length of time required to produce conception when contraceptive practice is interrupted for that purpose.

[8]The non-contraceptive experience of twelve women who used contraceptives for a very brief time, and then stopped using them, is included in this category. This inclusion, however, does not change the rates significantly.

Years Since First Marriage	Exposure and Pregnancies					
	Contraceptives Used (1)		No Contraceptive Used (2)			
			Temporarily (a)		Habitually (b)	
	Exposure (Years)	No. of Preg.	Exposure (Years)	No. of Preg.	Exposure (Years)	No. of Preg.
Column No.	1	2	3	4	5	6
All first pregnancies	292.4	116	31.3	139	150.9	410
Second and succeeding pregnancies (total)	3,570.0	998	74.8	243	259.3	264
0– 4	1,342.8	429	38.8	125	149.6	173
5– 9	1,342.2	373	29.8	104	63.5	61
10–14	657.5	160	2.0	11	25.9	17
15–19	194.3	32	4.2	3	14.6	10
20–29	33.3	4	—	—	5.7	3

Table 2. Number of years exposed to risk of pregnancy and number of pregnancies experienced (1) while using contraceptives, (2a) while temporarily omitting the use of contraceptives, and (2b) while habitually using no contraceptive.

time during which conditions are peculiarly favorable for conception. It is important, therefore, that in measuring the effectiveness of contraceptive practice, we limit ourselves to comparing the pregnancy rates exhibited by women while using contraceptives with those exhibited by women who habitually used none.

A similar difficulty arises if we do not separate exposure to the risk of first pregnancy from exposure to the risk of succeeding pregnancies. Lactation cannot be present before the first pregnancy, but may be a factor in exposure to risk of all succeeding pregnancies, both for women habitually using contraceptives and for those using none. In the case of second and succeeding pregnancies exposure was divided into five dura-

tion-of-marriage groups, since we know that pregnancy rates decline after the first years of married life, and we also know that exposure while using contraceptives and exposure while using none are differently distributed throughout the married life of these women.[9]

Our final classification permits us to compare experience when contraceptives were used with each type of non-contraceptive experience for similar periods of married life, and for first pregnancies as well as for second and succeeding pregnancies. Table 2 gives the total exposure falling into each category, designated as person-years exposure to the risk of pregnancy, and the number of pregnancies experienced during this exposure. Table 3 gives the pregnancy rates computed from these data as the number of pregnancies per one hundred person-years exposure to the risk of pregnancy.

EFFECTIVENESS OF CONTRACEPTIVE PRACTICE

For first pregnancies the rate for each group of women who did not practice contraception is significantly higher than that for women who practiced it. The rate computed for experience during habitual non-practice is seven times that observed when contraceptives were used. Further, the rate at which women become pregnant with the first child seems to be significantly higher after they have used contraceptives and interrupted that practice in order to become pregnant than is the rate for women who have never used contraceptives. Old wives maintain that women who have used contraceptives conceive less easily than those who have never used them. Our figures not only disprove this point, but seem to indicate the exact reverse of it. We are at a loss to explain this, unless the difference, which in actual time does not exceed two months for each pregnancy, is attributable to the fact that in

[9]This was not done for first pregnancies because less than 1 per cent of first pregnancies occurred after the fifth year of married life.

Years Since First Marriage	Pregnancies per 100 Person-Years Exposure		
	Contraceptives Used (1)	No Contraceptive Used (2)	
		Temporarily (a)	Habitually (b)
Column No.	1	2	3
All first pregnancies	40	444	272
Second and succeeding pregnancies (total)	28	325	102
0– 4	32	322	116
5– 9	28	349	96
10–14	24	—[1]	66
15–19	16	—[1]	68
20–29	12	—[1]	53

[1]Less than five years exposure.

Table 3. Comparison of pregnancy rate per 100 person-years exposure to risk of pregnancy for women, (1) while using contraceptives, (2a) while temporarily omitting use of contraceptives, and (2b) while habitually using no contraceptive. (Based on Table 2.)

many marriages a certain amount of time elapses before complete entry takes place. For women who have never used contraceptives, this time is included in exposure while using no contraceptive; but for women who interrupt contraceptive practice it is included in exposure while using contraceptives.

For second and later pregnancies there is only about half the difference between the rate at which women become pregnant while using contraceptives and the rate while habitually using none, that there is between these two types of experience for first pregnancies. Lactation may be present in both these categories at any time after the first pregnancy, but it is present in much higher proportion in the experience of those women who never practiced contraception than in the experience of those women who always used contraceptives. After the first pregnancy, absence of lactation during the exposure of those women who cease using contraceptives in order to be-

come pregnant appears to be sufficient reason for their relatively high pregnancy rate as compared with that of women habitually using no contraceptive. These differences hold for all duration-of-marriage groups. Relative differences change slightly in the later duration groups, but because of the small numbers involved, these changes cannot be regarded as significant. We can therefore conclude that in all durations of married life and for first, as well as for later pregnancies, the pregnancy rate of this group of women is significantly reduced by their use of contraceptives.

Table 3 has answered our question concerning the effectiveness of contraception in terms of reduction of the rate at which women become pregnant under given conditions relating to order of birth and duration of married life. We now need a generalized and more concrete form with which to indicate the effectiveness of contraception. This is given in Table 4, which compares the number of pregnancies actually experienced, during the time when contraception was practiced, with those which would have occurred during an equal length of exposure to pregnancy had no contraceptives been used.

We have assumed for this purpose that if the women habitually using contraceptives had never used any, they would have become pregnant at the same rate as those women who actually never did use them. On the basis of this assumption we have applied the pregnancy rate for women habitually using no contraceptive to the number of person-years exposure to the risk of pregnancy experienced by women while using contraceptives. Our results indicate that the number of pregnancies actually experienced is only about one-fourth the number of those expected.

It must be emphasized that we are comparing the number of pregnancies occurring in equal units of time during which conception is possible and not during equal units of married

Years Since First Marriage	Pregnancies per 100 Years Exposure Contraceptives Never Used (Col. 3, Table 3)	Exposure to Risk (Years) Contraceptives Used (Col. 1, Table 2)	Expected Number of Pregnancies if No Contraceptive Were Used (Col. 1 x Col. 2) / (100)	Observed Number of Pregnancies When Contraceptives Were Used (Col. 2, Table 2)
First pregnancies	272	292.4	795	116
Second and succeeding pregnancies				
0– 4	116	1,342.8	1,558	429
5– 9	96	1,342.2	1,289	373
10–14	66	657.5	434	160
15–19	68	194.3	132	32
20–29	53	33.3	18	4
TOTAL	—	—	4,226	1,114
Ratio of observed to expected pregnancies	1,114 ÷ 4,226 = 26.4 per cent			

Table 4. Ratio of observed to expected number of pregnancies for women habitually using contraceptives, had no contraceptive been used.

life. Since it is impossible for a woman to conceive when she is already pregnant, contraception by its very success in preventing pregnancy increases the time during any woman's life when there is a chance for it to fail. Therefore, we cannot conclude from these results that women who habitually use contraceptives throughout their married life would average one-fourth as many pregnancies as those who did not practice contraception. These data simply show that for a given exposure to the risk of conception about one-fourth as many pregnancies were observed when contraceptives were used as would be expected if no contraceptives had been used.

In this limited sense contraception was about 75 per cent

effective in preventing pregnancy. However, since these women as a group exhibited a high fertility, and an expressed interest in limiting their families, they may have practiced contraception with unusual diligence. Such diligence would tend to make the ratio of effectiveness higher than we should expect to find in the general population.

SUMMARY

A study of the pre-clinic contraceptive practices of a group composed largely of foreign-born Jewish women who came to a birth control clinic in New York City in 1931 leads to the following conclusions:

(1) More than 95 per cent of these women had practiced some form of contraception before coming to the clinic. Forty per cent of them used contraceptives immediately after marriage, and an additional 40 per cent started using them before their second pregnancy.

(2) Contraception of all types *when* and *as* practiced by these women significantly reduced their pregnancy rate before they came to a birth control clinic for special training in the use of approved contraceptive devices. Over a given period of exposure to the risk of conception such contraceptive practice was about 75 per cent effective in preventing pregnancy. The success of such practice for this selected group of overtly fertile women, who are especially interested in limiting their families, may be greater than we should expect to find in a similar group of women who did not eventually attend a birth control clinic.

HEALTH DEPARTMENT NURSING SERVICE FOR URBAN FAMILIES[1]

by MARIAN G. RANDALL, R.N.

TO what extent is an urban population reached by the health department nurses, when an accepted standard of service is provided?

In Syracuse, the city which in 1931 and again in 1932 achieved first place for outstanding accomplishments in the nation-wide interchamber health conservation contest sponsored by the United States Chamber of Commerce, a study was made of the health department nursing services rendered to an unselected sample of the population. It was revealed that for over a thousand families, selected at random, 15 per cent received clinic or home-nursing services from the city health department nurses.

In the following summary of some results of this study, especial attention will be given to (1) some of the factors influencing the selection of families who receive nursing service, and (2) some analysis of the frequency with which families received services.

PROGRAM AND PERSONNEL OF THE SYRACUSE NURSING BUREAU

The Syracuse Health Department, through its Bureau of Public Health Nursing, sponsors a so-called generalized nursing program. It includes services for communicable disease, tuberculosis, prenatal work (for mothers to be delivered in hospitals), infant hygiene, preschool hygiene, and school hygiene for parochial schools.[2] During the period of this study,

[1]From the Division of Public Health Activities, Milbank Memorial Fund.

[2]The program of the other agencies in the City whose cooperation has been a large factor in the effectiveness of the city's health program, includes (1) school nursing for children in the public schools by the nursing service of the Board of

(continued on page 70)

the personnel of the Nursing Bureau consisted of a director, an educational director, three generalized district supervisors, specialized supervisors for tuberculosis, mental hygiene, maternity and child hygiene, and thirty-two staff nurses. These agents of the City Health Department served a population of over 215,000. About 80 per cent of the people in this industrial city are native-born and over 50 per cent are of native parentage.

METHOD OF THE STUDY

An unusual opportunity to measure the extent of nursing services in urban families was afforded through the collaboration of the Milbank Memorial Fund with the United States Public Health Service in a series of epidemiological studies in Syracuse. Repeated observation of 1,323 families in various sections of the City, provided information about the economic status, health problems, and the amount of medical and nursing service the families received. Most studies of public health nursing are based entirely on the cases registered with the organization; these are of real value in showing the type of work accomplished. They give no data, however, for the large number of families who were *not visited* by the public health nurses. In this inquiry, a different method was employed, namely, to ascertain the amount and kind of public health nursing supervision received during a twelve-month period by an *unselected* group of families of different sizes, age composition, and economic status.[4]

All of the families observed lived in Syracuse the entire

Education, and (2) prenatal delivery service, postpartum care and general bedside care in acute and chronic illnesses by the Visiting Nurse Association.

[4]Similar studies are being made of urban families in two areas in New York City and of rural families in two counties in Virginia. One report has been made for a sample of rural families in Cattaraugus County, New York: Randall, M. G.: Public Health Nursing Service in Rural Families, Milbank Memorial Fund *Quarterly Bulletin*, October, 1931, ix, No. 4, p. 189.

period from February 1, 1930 through January 31, 1931. The records obtained for the families by the Public Health Service were carefully matched with the nurses' records of all services rendered.[5] Knowledge of the policies of the Health Department, repeated conversations with the nurses and observations of their work in homes and in clinics, have made possible the interpretations which records alone fail to supply. All of this information was freely given, and grateful acknowledgements are made to the Syracuse Health Department and its personnel.

Representativeness of the Sample of Families Observed. The families for whom records were obtained composed the population of eight areas, selected with the advice of local health agencies as typical of the City. A comparison of the distribution of the total rent-paying families of Syracuse according to monthly rentals with that of the families observed was made possible by special information from the 1930 census tracts from the Federal census bureau. Our sample is fairly representative as regards economic status, as shown in the accompanying tabulation.

Per cent of families paying specified rents.

Monthly Rent	Sample of Families	All Families
$50+	27.5	33.1
$20–$49.99	67.9	62.6
Under $20	4.4	4.2

Both the rents paid and the value of owned property in our

[5]In planning to secure factual material from the nurses' records it was necessary to emphasize the importance of sufficient uniformity in record-keeping to give comparable data about every case and every visit. Aside from any so-called "statistical use" this completeness of record-keeping is essential, of course, if records are really used as instruments of administration and supervision and as a means of insuring continuous care for the individuals in the families. (There is a need for detailed written instructions for record-keeping in most public health organizations.) No change was made in the record system. A folder giving the family census and social history, and a narrative sheet containing information about nursing visits to all members of the family were available for some of the families. Call slips, carried in the nurses' notebook and later filed in

(continued on page 72)

sample of families also show a close correlation with the economic ratings given by the Public Health Service investigators. These ratings, which were based on the general impression formed after the family had been visited and keeping in mind relative differences within the group rather than comparisons with other types of communities, were used in our study.[6] To facilitate discussion, the economic levels have been combined into three groups and designated as "comfortable," "moderate," and "poor." Our sample compares favorably with the total families with respect to nativity, as well.

EXTENT TO WHICH FAMILIES RECEIVED NURSING SERVICES

Of our sample of 1,323 families, 196, or approximately 15 per cent, received clinic or home nursing services from the city public health nurses during a twelve-month period. While this inquiry is concerned only with the work of the Health Department, it is also significant that 98 other families reported that they received some service from public school nurses and the Visiting Nurse Association. This makes a total of 294, or 22 per cent, of our sample of Syracuse families who received one or more public health nursing services.

The question quite naturally arises as to the need for public health nursing services in the remaining 78 per cent of the families. Not all of the families need to be given direct service, and obviously not all who need such a service can be given it, even with unusually good facilities. Some selection is necessary. In making such a selection a number of factors must be taken into account among which, aside from emergencies, are

the office, were the only nursing records for many of the families and a few items about the content and results of nursing visits and economic status were added to these slips.

[6]The investigators' ratings were used because they had visited in all the families but for the families known to the nurses there is a close correlation of the economic ratings given by the two groups of workers.

the age composition of the family and its economic status. On this important point, the following findings are of interest.

Extent to Which Services Were Given to Families of Different Economic Status. Of families classified as "comfortable" only 9 per cent received any nursing service, while 14 per cent of the "moderate" and 34 per cent of the "poor" families had some contact with the health department nurses. (Table 1). In other words, as would be expected, the receipt of health department nursing service is in inverse relation to economic status.

The needs for public health nursing service are greater in the families in the lower economic levels not only because of their inability to meet their problems but because so often the number of children and the frequency of prenatal and infancy cases increase their health problems. In our sample of 1,313[2] urban families (Table 2), 72 per cent of the "poor" families have one or more children under 16 years of age as contrasted with 45 per cent of those families classed as in "comfortable" circumstances.

Table 1. Families receiving health department nursing services, classified by economic status.

Economic Status	Number of Families	Families Receiving Clinic or Home Services from Health Department Nurses[1]	
		Number	Per Cent
All Families	1,313[2]	195	14.9
Comfortable	388	36	9.3
Moderate	762	104	13.6
Poor	163	55	33.7

[1]Excluding nursing service in the parochial schools carried on by the health department nurses.

[2]Excluding 10 families, one of which was visited by a nurse, for which no economic status was given.

Economic Status	Number of Families	Families Having One or More Children Under 16 Years of Age	
		Number	Per Cent
All Families	1,313	748	57.0
Comfortable	388	175	45.1
Moderate	762	455	59.7
Poor	163	118	72.4

Table 2. Per cent of families with children in each economic class.

An indication of the extent to which health department nurses are able to render some service for the health of city children is shown in Table 3. As stated before, the health department nurses carry the school health work for the parochial schools only. It is fair to exclude, therefore, the 172 families in which there were only children of school age attending public schools. Thirty-three per cent of all the remaining families with children received some nursing service. Without any deliberate or planned selection of families to receive service on the basis of economic ratings, the needs of the poorer families would bring about a natural selection. The actual experience with these families shows that 49 per cent of the "poor" families with children received nursing service as contrasted with 29 per cent in "moderate" circumstances and 33 per cent of the families in the "comfortable" class. It must be realized, however, that this means 51 per cent of the "poor" families and 71 per cent of the "moderate" families with children did *not* receive any public health nursing supervision in a twelve-month period.

Needs of Families not Receiving Supervision. What are the needs of the families not reached by the public health nurses? Information regarding the composition or make-up of these families is an indication of the possibility of specific health problems to which the nurses were not able to give supervi-

Economic Status	Families Having One or More Children		
	Total Families	Received Nursing Service	
		Number	Per Cent
All Families	576[1]	192	33.3
Comfortable	102	34	33.3
Moderate	364	104	28.6
Poor	110	54	49.1

[1]Excluding 172 families in which there were only children of school age, attending public schools. Also excluding 4 other families, one of which was visited by a nurse, for which no economic status was given.

Table 3. Per cent of families with children who received health department nursing service, by economic status.

sion. There were 384 families with one or more children who did not receive nursing services. The per cent of families having children of each broad age group who did not receive service is shown in Table 4.[7] Of the total 147 families in which there were infants, only 25, or 17 per cent, did not receive nursing services. This undoubtedly reflects the practice of the health department nurses delivering birth certificates and making at least one health supervision visit to every infant whose birth is registered in the City.

There were 150 school families, that is, families with children attending parochial schools. Of these families, 77, or 51 per cent, did not receive home visits from the nurse. Since not all of these children had a school health examination during the year studied there may not have been a reported need for a visit in every one of these school families.

There were preschool children in 361 of the families in our sample and 284, or 79 per cent, of these preschool families did

[7]Age groupings are those at the beginning of period studied; infants under one year or born during period; preschool 1 to 5 years; school 6 to 16 years. Inasmuch as the health department nurses include only parochial school children in their school health program, the families with children of school age only were excluded if the children attended public school.

not receive any health supervision. As shown in Table 4, 60 per cent of the "poor" preschool families were not visited which seems significant in indicating that more health supervision could profitably be extended to the children of this age group. Tabulations of the generalized visiting, that is, the way in which visits to different age groups were combined, will be discussed in detail in subsequent papers. It may be mentioned here, however, that our data seem to indicate that the largest proportion of preschool visiting is combined with visiting to children of other ages. This suggests that more services are needed in the families having children of preschool age only.

FREQUENCY OF NURSES' HOME VISITS

One indication of the opportunity for giving health education to a family is shown by the number of times the nurse visits in the home.[8] A tabulation of the year's visits (Table 5) of the 182 families in our sample of families visited shows that approximately one-third of the families were visited five or more times, a little over a third had two to four visits, and

Table 4. Families with children of various ages who did *not* receive services from the health department nurses.[1]

Economic Status	Infant Families			Preschool Families			School Families[2]		
	Total	Not Visited		Total	Not Visited		Total	Not Visited	
		No.	Per Cent		No.	Per Cent		No.	Per Cent
Any Status	147	25	17.0	361	284	78.7	150	77	51.3
Comfortable	29	7	24.1	66	56	84.8	22	20	90.9
Moderate	81	13	16.0	218	182	83.5	106	53	50.0
Poor	37	5	13.5	77	46	59.7	22	4	18.2

[1]A given family may have children in one or all age groups.
[2]Parochial school children only.

[8]Visits are here considered as the instances or times the nurse visited a given household regardless of the number of individuals in the household visited.

Economic Status	Per Cent of Families Receiving Stated Number of Visits				Number of Families Receiving Stated Number of Visits			
	One or More	1	2–4	5+	One or More	1	2–4	5+
All Families	100.0	30.8	37.4	31.8	182[1]	56	68	58
Comfortable	100.0	63.3	30.0	6.7	30	19	9	2
Moderate	100.0	27.5	45.9	26.5	98	27	45	26
Poor	100.0	18.5	25.9	55.6	54	10	14	30

[1]Excluding 13 families who had clinic service only.

Table 5. Frequency of public health nursing visits during a twelve-month period to families of different economic status.

about a third were visited once. The frequency of these visits seems to be associated with economic status, for, as shown in the same table, 63 per cent of the "comfortable" families were visited but once, while only 18 per cent of the "poor" families did not receive a return visit. Undoubtedly more service is needed in the poorer families, a point which should be considered in planning for the most profitable use of available services.

It is customary to report upon public health nursing activities by stating the total number of visits made and the number of visits for each type of problem, such as maternity, infancy, and tuberculosis. This is important in showing the distribution of work in various types of services but it does not indicate the number of people or families who received this service. In this study we were able to relate the nurses' home visits to the families in our sample and thus to ascertain how the total visits were distributed according to families which received varying degrees of concentration of service. Only the families with infants, children of preschool age, or children of school age attending parochial schools were considered. In other words, only the families that would be most

likely to receive some health department nursing service were included. There were 564 families in this sample and there were 713 home visits made by the nurses. Figure 1 shows these visits were distributed to these families as follows:

68 per cent of the families were not visited.

10 per cent of the families received one visit which comprised 8 per cent of the total visits.

5 per cent of the families were visited twice. That is, there were 30 families who received two visits from the nurses and that totaled 60 visits or 8 per cent of the total visits.

4 per cent of the families received 3 visits which amounted to 9 per cent of the total visits.

10 per cent of the families who were visited five or more times during the year received 63 per cent of the total visits.

If the 10 per cent of the families who received 63 per cent of the total visits were those in which many and serious health problems existed, then it might be entirely justifiable to give them such a large per cent of the total visiting. Obviously, some families require more services than others. This finding, however, raises an important point, namely: the nurse should know and realize how her efforts are being distributed. If she analyzes her activities, she might decide, for example, that some of the 63 per cent of her

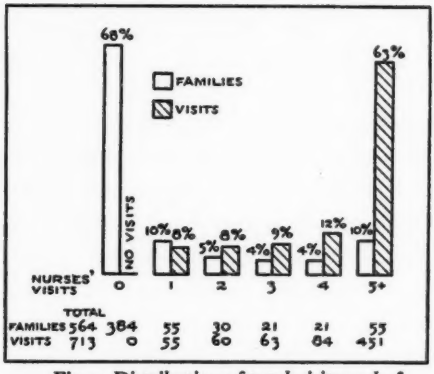

Fig. 1. Distribution of total visits and of total families with children according to frequency of nurses' visits.

visits could more profitably be given to some of the 68 per cent of the families in the "not visited" group.

SUMMARY

Although not all families require the direct services of public health nurses, and although all those who do require some do not need the same type or amount of service, it is the aim of the Health Department to carry health education into as many homes as possible. The extent to which, under present practice, the families receive some service from city health department nurses is significant information that can be used in evaluating health services as well as for planning for future health programs.

In an unselected sample of families living continuously in the City of Syracuse during the year studied, 15 per cent received some nursing service in the clinics or homes.

Thirty-three per cent of the families having one or more children received some public health nursing supervision.

The needs of the families not visited are indicated by the children in the not visited families and in the experience of this City it was particularly significant to find that 79 per cent of the families having preschool children were not visited by health department nurses. This would seem to indicate that more extension of health services was needed for this age group.

The per cent of families receiving health supervision and the amount of service they receive is in inverse relation to economic well-being. The needs are greater, of course, in the families of lower income levels, a fact which must be considered in selecting which families shall receive the amount of service available.

Some families require intensive and repeated services because of many and serious health problems, but it is impor-

tant for the nurse to know how her services are being distributed. An analysis of the distribution of the total home visits to our sample of families in which there were children, by frequency of visits, shows that 10 per cent of the families visited were visited five or more times and this comprised 63 per cent of the total visiting. From a public health point of view it is essential to keep in mind the accomplishment of results for the greatest number of people, and to this end it is essential to take stock not only of quantity but of the quality and effectiveness of the nurses' contacts with the people. One well-planned, thoughtful home visit, for example, can be more effective than several more or less casual calls. Any limitation in the amount of service available makes it essential to plan for a selection of families most in need of supervision, to endeavor to determine in which of these families results can be accomplished by intensive service, and to consider the extent to which available services can be given profitably to the greatest number of families living in the city.

SCHOOL NURSING CONSULTATION SERVICE IN THE BELLEVUE-YORKVILLE DISTRICT

by JOSEPHINE W. PRESCOTT[1]

THE Bellevue-Yorkville Health Demonstration has been constantly experimenting with the problem of adjusting the load of work to a limited number of staff nurses. To conserve nurses' time and to increase the effectiveness and extent of nursing service for school children, an experiment was tried out of substituting a school consultation service for nurses' visits to the homes. The experiment has been considered successful. The parents in the district have responded very well. For the first six months of this experiment there was less time spent on school work by the nurses, a greater number of parents were contacted by the nurse, and more defects were corrected, all of which would seem to indicate that the plan can be used profitably in the metropolitan area of New York City.

Consultations in school are not new but previously they had been held as a supplement to, rather than a substitute for, home visiting. This school consultation service was set up as a part of the established generalized nursing program being carried on in this district by the City Department of Health. The mother's visit to the nurse was planned to give an opportunity not only for a discussion of the need for correction of the school child's reported defects but for discussion and advice concerning the health problems of all members of the family. With a knowledge of the community facilities, the nurse may direct the mother to sources of assistance in social and economic difficulties, and the opportunity is also afforded to advise medical supervision of all

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infants and preschool children either with a private physician or a well children's clinic.

Letters were sent out requesting the parents to come to the school at specified times to observe the medical inspection of their children and to consult with the nurse regarding the reported findings. These letters were signed by the school principal. Fifty-five per cent of the parents came to the school to observe the medical examinations and 39 per cent kept the appointment for a consultation with the nurse. The others were given a second chance to visit the nurse and about 25 per cent of these parents responded. An indication of the volume of work is shown by the fact that 8,815 invitations were sent to parents to report to school and 7,103 visits were made by parents—a few of whom came without invitation. At the time of these consultations in the school, the problems of over 11,000 children of different ages were discussed.

To ascertain why some of the parents did not come to the school after receiving two letters, a visit was made to a sample of 327 homes. It was of interest to find that 30 per cent of these parents claimed they did not receive the letters. The letters are given to the children by the class-room teacher and it is probably true that if more attention were given to explaining the importance of having the children return an answer from the parent, a large part of this difficulty could be corrected. The other reasons given by the parents, which, of course, could have been written on the blanks and returned to the teacher, were "too busy", 28 per cent; illness in the family, 15 per cent; the mother or both parents working, 9 per cent; and such reasons as, defects had been corrected, or mother was away, for the remaining.

The amount of nurses' time spent on school work and the number of defects corrected may be used as indices of accomplishment. A comparison of these, for the first six months of

the experiment, with the same months of the previous year, 1932, indicates a greater efficiency for the new system. Under the new system it is estimated that 1,200 less hours were spent on school work and 1,467 more defects were corrected than under the old system. The increase in corrections was largely for defects of vision, tonsils, and teeth.

The total time spent on school work includes that required for assistance at medical examinations and time spent on a few home visits to school children made necessary by suspicious contagion, reported illness, and difficult behavior problems. Also, if the family was being visited for other purposes, the school child was included in the generalized visit. Thirty-seven per cent of the total school time was devoted to the consultation service. If the total time spent on the consultation service in both districts is divided by the number of visits made by the parents, 21.8 minutes is derived as the average time spent by the nurse for each visit, while if the time is divided by the number of children *discussed* (not including infants and preschool children not registered in Department of Health clinics) the result is 14.5 minutes per child. This includes the time for preparation for the clinic and all the necessary record work.

In considering the time spent on school work, the new plan has certain advantages: (1) the travel time between homes is eliminated; (2) with only a few home visits made, most of the non-productive contacts, that is, "not found" and "not home" visits, have been eliminated; (3) although the time set aside for the school consultation is not always used for this purpose if the parents fail to report, the time is not wasted as there is an abundance of school record work to be done; and (4) the consultation service is developed on a family basis, and thus many visits that would have been made to infant and preschool children are eliminated.

The experience in Bellevue-Yorkville seems to show that a school consultation service can be successfully substituted for most of the nurses' visits to the homes of school children. The nurse has an opportunity to contact many more parents, much fruitless effort is eliminated, and the attitude of the parent is likely to be more satisfactory when she comes to the school in that she is prepared for the conference and is not annoyed by the many distractions which may occur in her apartment. It is recognized, however, that information which may be used for giving practical advice and gaining an understanding of the family situations and relationships is lost when no contact is made with the home. Probably the best plan would be a modified one, with most of the health teaching done with the parent in the school, and some visiting in the homes when the parent fails repeatedly to keep an appointment or when the home situation has an important bearing on the child's problem.

A STUDY OF THE CHINESE POPULATION[7]

by CHI-MING CHIAO

CHAPTER III

THE AGE AND SEX COMPOSITION OF THE CHINESE POPULATION

THE age composition of a population may not appear, at first glance, to be of much importance. Every population has people of all ages in it, but the number of persons in each age group differs greatly from one population to another population. For example, South China has a larger proportion of young people than North China, a situation which, if other factors did not enter in, would result in a lower death rate, since mortality rates increase with age. In Tables 5 and 6 the total population is classified by five-year groups above five and single-year age groups under five in order to make a comparison, as a standard, with the age distribution for eleven European countries in 1900, made by G. H. Knibbs and C. H. Wickens, statisticians of the Commonwealth of Australia.[8] (Fig. 3.)

There is no great difference between the age distribution of the Chinese population and that of the eleven European countries. The age groups in which the Chinese data have a distinctly lower percentage than the European countries are: 10-14, 15-19, 20-24, and 60 and above. There are some other age groups, 0, 3, 4, under 5, 5-9, and 35-39 which have a higher percentage than the standard.

[7]From the Department of Agricultural Economics of Nanking University, and the Division of Research, Milbank Memorial Fund. This study was made in cooperation with the Land Utilization Project financed by the China Council of the Institute of Pacific Relations. The first two chapters of Mr. Chiao's study were presented in the October issue of the *Bulletin* and the remaining chapters will appear in the April and July issues.

[8]Whipple, G. C.: Vital Statistics. New York, John Wiley and Sons, Inc., 1923 (Second Edition), p. 193.

The unevenness in Chinese population by single years under 5 is caused by the under-reporting of younger children. But in spite of under-reporting and a high mortality from

Table 5. Percentage age distribution of the population for China, India, eleven European countries, and the United States (rural farms 1930).

Age (In Years)	China	11 European Countries (1900)[1]	India (1921)[2]	U. S. A. (Rural, Farms 1930)[3]
0	3.2	2.46	2.9	2.1
1	2.4	2.43	1.4	—
2	2.3	2.41	2.4	—
3	3.1	2.38	2.9	—
4	2.5	2.35	2.9	—
0– 4	13.5	12.03	12.5	11.1
5– 9	11.9	11.35	14.7	12.5
10–14	9.9	10.61	11.7	12.4
15–19	9.2	9.82	8.3	11.3
20–24	8.8	8.98	8.3	8.1
25–29	8.4	8.12	8.8	6.0
30–34	6.9	7.25	8.3	5.5
35–39	6.9	6.40	6.0	11.4
40–44	5.6	5.57	6.2	—
45–49	5.6	4.79	3.7	9.8
50–54	4.0	4.04	4.4	—
55–59	3.6	3.36	1.8	6.6
60–64	2.3	2.70	2.8	—
65–69	1.6	2.08	0.8	3.7
70–74	0.9	1.46	1.7[4]	—
75–79	0.5	0.89	—	1.5
80–84	0.2	0.41	—	—
85 and over	0.1	0.14	—	—
Age unknown	0.1	—	—	—
TOTAL	100.0	100.0	100.0	99.9

[1]See footnote 8.

[2]Census of India, Vol. I, Part II—Tables. Governmental Printing Press, Calcutta, 1921.

[3]Brunner, E. de S., and Kolb, J. H.: Rural Social Trends. New York, McGraw-Hill Co., Inc., 1933, pp. 17-19. The United States figures after age 34 are for ten-year groups up to 75 and over.

[4]70 and over.

Age (Years)	Number of Persons			Per Cent		
	China	North China	South China	China	North China	South China
0	2,179	979	1,200	3.2	3.3	3.2
1	1,610	781	829	2.4	2.6	2.2
2	1,570	717	853	2.3	2.4	2.2
3	2,098	852	1,246	3.1	2.8	3.3
4	1,674	692	982	2.5	2.3	2.6
0- 4	9,131	4,021	5,110	13.5	13.4	13.5
5- 9	8,037	3,240	4,797	11.9	10.8	12.7
10-14	6,662	2,817	3,845	9.8	9.4	10.2
15-19	6,239	2,653	3,586	9.2	8.8	9.5
20-24	5,949	2,656	3,293	8.8	8.8	8.7
25-29	5,666	2,386	3,280	8.4	8.0	8.7
30-34	4,668	1,918	2,750	6.9	6.4	7.3
35-39	4,641	2,022	2,619	6.9	6.8	6.9
40-44	3,752	1,813	1,939	5.5	6.1	5.1
45-49	3,774	1,847	1,927	5.6	6.2	5.1
50-54	2,720	1,248	1,472	4.0	4.2	3.9
55-59	2,441	1,101	1,340	3.6	3.7	3.6
60-64	1,713	798	915	2.5	2.7	2.4
65-69	1,079	645	434	1.6	2.2	1.2
70-74	606	397	209	0.9	1.3	0.6
75-79	338	214	124	0.5	0.7	0.3
80-84	133	79	54	0.2	0.3	0.1
85 and over	50	31	19	0.1	0.1	0.1
Age unknown	44	23	21	0.1	0.1	0.1
TOTAL	67,643	29,909	37,734	100.0	100.0	100.0

Table 6. Age distribution of the population; 12,456 farm families, 22 localities, 11 provinces, North and South China, 1929-1931.

contagious diseases, such as smallpox, diphtheria, and measles, the proportion of the total population which is under five years of age is larger than in other countries. This can be ascribed only to a higher birth rate. The chief causes for the lower percentage in China for the age groups of 10-14, 15-19, and 20-24 are probably the emigration of males and

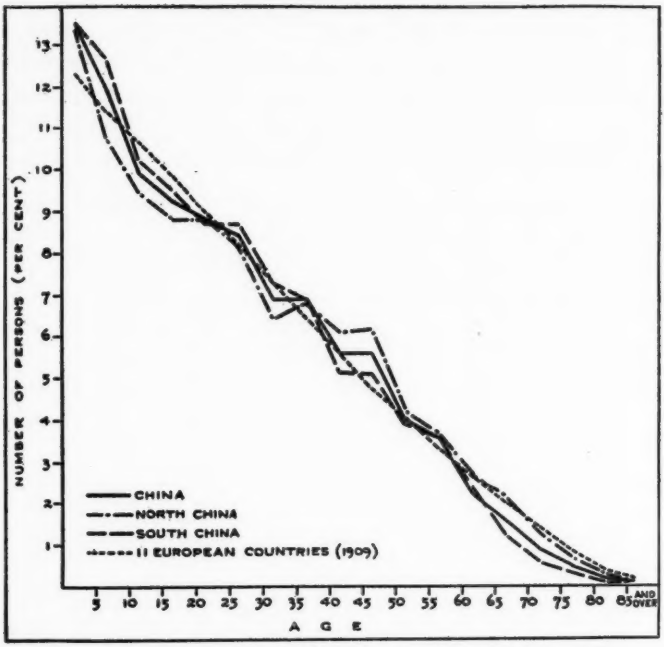

Fig. 3. Percentage age distribution of the population; China and eleven European countries.

the under-reporting of females, principally for the ages 10-19. The relatively small proportion of Chinese who are 60 or more years of age can only be explained by a shorter average duration of life in China than in Europe.

The comparison of North and South China shows that in North China the ages from 5 to 39 have a smaller percentage except that the age group 20-24 is higher by one-tenth of one per cent than in South China. But above the age 39, North China has a higher percentage than South China, except for ages 85 and over which are equal. The chief causes are probably the greater emigration of middle-aged people to Manchuria and the under-reporting of persons of certain

specified ages in North China. For instance, in the years 1924, 1925, and 1926, the total number of immigrants to Manchuria from Hopei, Shantung, and Honan provinces were 613,709 persons.[9] There was still more migration before and after this period. Seven out of nine of the localities in this study are in these three provinces of North China. The much lower percentage in the age group 5-9 for North China is probably due to a higher infant and child mortality.

In comparing the Chinese population by ten-year groups with available information for other countries in Table 7, it is seen that under age 10, China has 25.4 per cent, or the highest proportion, while France has 13.9, or the lowest proportion. A possible explanation is that China has a higher birth rate than France. In the age group 10-19, Germany has the highest per cent of 20.4 and France has the lowest per cent of 17.7. China has 19.1 per cent, which is higher than France, England and Wales, and the United States.

Table 7. Percentage age distribution (decennial groups) of the Chinese populations and of those for other countries.

Age (In Years)	China (1929–1931)			England and Wales[1] (1921)	France[1] (1921)	Germany[1] (1925)	Sweden[1] (1920)	United States[1] (1930)
	Total	North	South					
Under 10	25.4	24.3	26.3	18.1	13.9	15.8	19.3	22.6
10–19	19.1	18.3	19.7	18.9	17.7	20.4	19.5	18.7
20–29	17.2	16.8	17.4	16.1	15.1	18.3	16.3	17.4
30–39	13.7	13.2	14.2	14.6	14.3	14.2	13.3	13.7
40–49	11.1	12.2	10.2	13.2	13.8	12.5	10.8	11.6
50 and over	13.5	15.2	12.2	19.1	25.2	18.8	20.9	16.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Thompson, W. S.: Population Problems. New York, McGraw-Hill Book Company, Inc., 1930, p. 58.

[9] Kiang, W. H.: Emigration to Manchuria. Proceedings of the First Annual Conference of Chinese Sociological Society, 1932. (in Chinese) p. 143.

But it is lower than Germany and Sweden. Why has Germany a higher percentage of population in age 10-19 and a lower percentage of population under age 10? Obviously Germany had a lower birth rate during the World War. The total percentages for age groups 20 up to 49 are nearly the same for all countries except Sweden which had the lowest figure, 40.4 per cent, and Germany which had the highest, 45.0 per cent.

Judged by Sundbärg's standard[10] the Chinese population is slightly progressive. (Table 8.) The standard classifies as "progressive" populations with a relatively large proportion of persons under fifteen years of age because that is the typical situation found in a growing population. Probably the Chinese population approximates this progressive type because it is a shorter lived group than the European population upon which the standard was based.

Table 8. The farm population in China compared with Sweden, United States, eleven European countries, and the progressive, stationary, and regressive types.

Region	Per Cent of Population by Age Groups		
	0–14	15–49	50+
China	35	51	14
North China	34	51	15
South China	36	52	12
Sweden (1751–1900)[1]	33	50	17
11 European countries (1900)[1]	35	51	14
United States (1930)[2]	36	48	16
Sundbärg's standard[1]			
Progressive type	40	50	10
Stationary type	33	50	17
Regressive type	20	50	30

[1]Whipple, G. C.: *op. cit.* pp. 189-193.
[2]Brunner, E. de S. and Kolb, J. H.: *op. cit.* pp. 17 and 19.

The sex composition of a population can be studied in two ways: first, by the percentage of age distribution for each sex. Second, by the ratio of males to 100 females in each age group.

The age distribution by sex is shown in Tables 9 and 10 and in Figure 4. For China as a whole, the male population

[10]Whipple G. C.: *op. cit.* p. 189.

shows some deficiency of persons in the ages from 10 to 34, and the female population in those from 5 to 34. In the case of the males this may be due in part to migration to Manchuria, and in the case of the females to the under-reporting of girls under 20 years of age for reasons already mentioned. Among married women over 20 years of age deaths from tetanus in childbirth (tetanus neotorium) may also be a contributing factor. The small proportion of both sexes present in the age group 30-34 is probably in part the result of the famine which accompanied the Boxer Rebellion in 1900-1901 in North China causing the death of many children and a drop in the birth rate.

Table 9. Age and sex distribution of the population; 12,456 farm families, 22 localities, 11 provinces, North and South China, 1929-1931.

Age (Years)	North China		South China	
	Male	Female	Male	Female
0	538	441	621	579
1	409	372	408	421
2	381	336	456	397
3	463	389	620	626
4	351	341	505	477
0- 4	2,142	1,879	2,610	2,500
5- 9	1,787	1,453	2,532	2,265
10-14	1,546	1,271	2,195	1,650
15-19	1,395	1,258	1,978	1,608
20-24	1,375	1,281	1,709	1,584
25-29	1,227	1,159	1,700	1,580
30-34	1,039	879	1,445	1,305
35-39	1,067	955	1,390	1,229
40-44	971	842	970	969
45-49	915	932	972	955
50-54	665	583	742	730
55-59	505	596	625	715
60-64	394	404	424	491
65-69	283	362	190	244
70-74	163	234	79	130
75-79	85	129	49	75
80-84	35	44	17	37
85 and over	6	25	4	15
Age unknown	17	6	14	7
Total	15,617	14,292	19,645	18,089

It is apparent from the age pyramid (Fig. 4) that there are fewer males in the age group from 10 to 34 in North than in South China. Migration to Manchuria from the Northern provinces doubtless accounts for the less even distribution of

Age (Years)	China		North China		South China	
	Male	Female	Male	Female	Male	Female
0	3.3	3.1	3.4	3.0	3.2	3.2
1	2.3	2.5	2.6	2.6	2.1	2.3
2	2.4	2.3	2.4	2.4	2.3	2.2
3	3.1	3.1	3.0	2.7	3.2	3.5
4	2.4	2.5	2.3	2.4	2.5	2.6
0– 4	13.5	13.5	13.7	13.1	13.3	13.8
5– 9	12.2	11.5	11.5	10.2	12.8	12.5
10–14	10.6	9.0	9.9	8.9	11.2	9.1
15–19	9.6	8.9	8.9	8.8	10.0	8.9
20–24	8.7	8.8	8.8	9.0	8.7	8.7
25–29	8.3	8.5	7.9	8.1	8.7	8.7
30–34	7.0	6.7	6.7	6.2	7.4	7.2
35–39	7.0	6.7	6.8	6.7	7.1	6.8
40–44	5.5	5.6	6.2	5.9	4.9	5.4
45–49	5.4	5.4	5.9	6.5	4.9	5.3
50–54	4.0	4.1	4.3	4.1	3.8	4.0
55–59	3.2	4.0	3.2	4.2	3.2	4.0
60–64	2.3	2.8	2.5	2.8	2.2	2.7
65–69	1.3	1.9	1.8	2.5	1.0	1.4
70–74	0.7	1.1	1.0	1.6	0.4	0.7
75–79	0.4	0.6	0.6	0.9	0.2	0.4
80–84	0.2	0.3	0.2	0.3	0.1	0.2
85 and over	—	0.1	—	0.2	—	0.1
Age unknown	0.1	—	0.1	—	0.1	0.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Table 10. Percentage age distribution of the population by sex; 12,456 farm families, 22 localities, 11 provinces, North and South China, 1929-1931.

the pyramid for the North. There is a dearth of females between the ages 5 and 34 in North China and the ages of 10 to 24 in South China. The explanation is the same as for China as a whole. In general, the South China population is distributed more symmetrically than that of the North because there were fewer outside factors such as famine, war, and migration to disturb the age and sex composition.

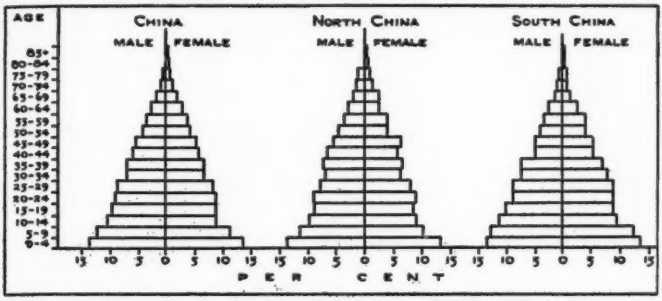

Fig. 4. Percentage, age, and sex distribution of the population; 12,456 farm families, 22 localities, 11 provinces, China, 1929-1931.

The ratio of males to 100 females is shown in Table 11 and Figure 5. The ratio is 109 for China, North China, and South China, respectively. The deviation from the average ratio of 109 for the various age groups is also shown in Table 11. For China, when we examine carefully the single year ages from 0 to 4, we find that at ages 0 and 2 there is more than the average excess of males but that at ages 1, 3, and 4 the proportion of males is somewhat lower than that for all ages. The excess of males in ages under 5 is more striking for North than for South China. It is safe to say that in China the under-reporting of younger children and deaths from diseases occur more for females than for males. The chief reason is that the females have a lower social status than males. In some parts of China there is always a tendency to under-report children under three years of age because such children are not treated as human beings for fear the evil spirits will cause them harm during the very early ages. In some parts of China, the people still feel that male babies are more important than females, and do not report them for fear something might happen to them, and thus male babies are not reported as well as female babies. In general, the opposite conditions will prevail because in

Fig. 5. Ratio of males to 100 females; 12,456 farm families, 22 localities, 11 provinces, China, 1929–1931.

most parts of China the people feel that the girl children are not very important. So deaths caused by infanticide and carelessness are more common with females.

In some parts of China, the children from ages 3 to 12 are also subject to certain age irregularities. When the children live until age three, parents like to report the child. This is also true for the twelve-year age. In China there is a typical system for counting age called the "twelve animal cycle." "Twelve" is a complete cycle and "three" is one-quarter of the cycle. So the ages "three" and "twelve" are the critical ages for children. The parents always feel that if their children are reported either before three or before twelve,

Age (In Years)	China		North China		South China	
	Ratio	Deviation	Ratio	Deviation	Ratio	Deviation
0	114	+5	122	+13	107	−2
1	103	−6	110	+1	97	−12
2	114	+5	113	+4	115	+6
3	107	−2	119	+10	99	−10
4	105	−4	103	−6	106	−3
0- 4	109	0	114	+5	104	−5
5- 9	116	+7	123	+14	112	+3
10–14	128	+19	122	+13	132	+23
15–19	118	+9	111	+2	123	+14
20–24	108	−1	107	−2	108	−1
25–29	107	−2	106	−3	108	−1
30–34	114	+5	118	+9	111	+2
35–39	113	+4	112	+3	113	+3
40–44	107	−2	115	+6	100	−9
45–49	100	−9	98	−11	102	−7
50–54	107	−2	114	+5	102	−7
55–59	86	−23	85	−24	87	−22
60–64	91	−18	98	−11	86	−23
65–69	78	−31	78	−31	78	−31
70–74	66	−43	70	−39	61	−48
75–79	66	−43	66	−43	65	−44
80–84	64	−45	80	−29	46	−63
85 and over	25	−84	24	−85	27	−82
Age unknown	238	+129	283	+174	200	+101
ALL AGES	109	0	109	0	109	0

Table 11. Ratio of males to 100 females by age, and the deviation of the ratio for each age group from that for all ages; 12,456 farm families, 22 localities, of 11 provinces, North and South China, 1929-1931.

unlucky things will happen to them.

In ages 5-19 there is an excess of males. The highest ratio is 128 in age group 10-14. The deviation from the average ratio is plus 19. This excess of males can be explained in three ways: first, it may be due to the under-reporting of brides and unmarried grown-up girls because of reluctance to report these persons. Second, in some of the famine regions

Country	Year	Per Cent of Total Population		Ratio of Male to 100 Female
		Male	Female	
China	1929–31	52.3	47.7	109
United States[1]	1930	50.6	49.4	102
England and Wales[2]	1920	47.7	52.3	91
France[2]	1920	47.5	52.5	91
Germany[2]	1920	48.4	51.6	94
Sweden[2]	1920	49.1	50.9	96

[1]Native White Population of Native Parents (1930). Fifteenth Census Reports on Population, Vol. II, Chapter 10. Washington, United States Government Printing Office, 1933.
[2]Thompson, W. S., *op. cit.*, p. 55.

Table 12. Sex composition of the population in different countries.

the girls are sold as brides or sons' fiancees in the non-famine areas. Third, more deaths of females may be caused in the group of married women of child-bearing age from tetanus, miscarriage, and suicide due to family unhappiness. The above explanation applies to both North and South China except in a different degree. From age 20-29 the sex distribution seems to be normal. A balancing tendency between male and female may result from two factors, first the migration of males and second, the death of females in child-bearing period. From age 30-39 there is a shortage of females, probably due to more deaths and some migration. In the age group 50 and over, there are more females than males caused by the natural tendency of males to be shorter lived.

In Table 12, the sex composition for different countries is shown. Of these six countries only China and the United States have a higher proportion of males than females. The low proportion of males in Europe may be accounted for in part by the large number of males killed in the war, by losses through emigration, and perhaps by a lower ratio of male to female births.